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TREATISE ON FEVER.

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With a mind so framed to accurate observation, and logical deduction, Dr. Smith's delineations are peculiarly valuable.—*Medico-Chirurgical Review, March.*

A

TREATISE ON FEVER.

BY

SOUTHWOOD SMITH, M. D.

PHYSICIAN TO THE LONDON FEVER HOSPITAL.

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TO HIS GRACE

THE DUKE OF SOMERSET,

PRESIDENT;

TO

THE VICE-PRESIDENTS,

TO THE

TREASURERS,

AND TO THE OTHER

GENTLEMEN CONSTITUTING THE COMMITTEE

OF THE

LONDON FEVER HOSPITAL;

IN

TESTIMONY OF HIS ADMIRATION OF THE DILIGENCE

WITH WHICH

THEY LABOUR TO PROMOTE THE PROSPERITY,

AND THE

CARE WITH WHICH THEY WATCH OVER THE INTERESTS

OF

THIS INSTITUTION;

WHICH, IN THE MAGNITUDE OF THE BENEFITS IT CONFERS,

NO LESS THAN IN THE

INEXPENSIVENESS OF THE MEANS

BY WHICH,

THROUGH THEIR ECONOMY, IT IS ENABLED TO SECURE THEM,

IS EQUALLED BY FEW ESTABLISHMENTS,

AND SURPASSED BY NONE;

THIS WORK IS INSCRIBED

BY

THE AUTHOR.

PREFACE.

The following Work is wholly of a practical nature: its object is to ascertain the real phenomena of Fever, and the most safe and effectual treatment of the disease. It was found impossible to include in this volume some researches of a statistical nature which it was at first intended to incorporate in the work.

On looking over the account which has been given of the phenomena, I find that, by an oversight, I have omitted to make any mention of the peculiar odour which belongs to a fever-patient. It is so characteristic that a person, familiar with the disease, might in many cases be able to pronounce, merely from the odour of the effluvia that arises from the body, whether the disease were fever.

I cannot allow this work to go forth to the world, without expressing my obligation to Dr. Dill, for the great assistance he has afforded me in the collection and arrangement

of the cases which illustrate the symptoms and the pathology, and in the construction of the tables. And I am happy to avail myself of this occasion to bear my testimony to the excellent history which is drawn up of every case admitted into the house; to the completeness of the record which is kept of the morbid appearances on inspection; to the care which is taken of the sick, in the absence of the physicians; and to the able and zealous manner in which, as the resident Medical officer of the Fever Hospital, he performs the arduous duties of his office.

S. S.

36, *New Broad Street,*
Dec. 1829.

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FEVER, &c.

CHAPTER I.

Further Investigation of Fever necessary: Facilities afforded by the Fever Hospital for prosecuting the Study. Ancient Doctrines relative to the Nature and Seat of Fever. Hippocrates, Galen, Sydenham. Modern Doctrines. Cullen, Brown, Stoker, Burne, Clanny, Clutterbuck, Broussais. Errors common to all these Theorists. Questions to be solved before Fever can be understood. Precise Object of Investigation: proper mode of conducting it.

On my appointment to the office of Physician to the London Fever Hospital, it was stated to me by the treasurer that, among the objects contemplated by the establishment of this institution, two things were conceived to be of paramount importance: first, the accumulation of facts by which the true nature of fever might be more certainly ascertained,

and secondly the cautious trial of remedies by which a more sure and successful mode of treating this fatal disease might be discovered. During my connexion with this hospital I have faithfully endeavoured to the utmost of my ability to keep these objects in view, and I now venture to lay before the public the result of my observations, in the hope that they may contribute something, however little, to the stock of knowledge already accumulated.

When we consider how many circumstances connected with the origin and the propagation of fever are wholly unknown, which if known might have a most important influence in preventing its occurrence, in arresting its progress or in lessening its mortality; when we consider in what profound obscurity the very nature of the agents that produce it is still involved; when we consider how easy it is to swell the long catalogue of its symptoms, but how difficult it is to discriminate which, even among the most prominent of the train, are the essential and which the adventitious, and how still more difficult it is to ascertain which are the invariable antecedents and which the invariable sequents, or which the causes and which the effects; when we consider how few comparatively of the external appearances have been ascertained to be the sure and certain signs of any known condition of the internal organs, and how often the existence of several known conditions of the organs remains altogether unsuspected until

the demonstration of it is afforded by inspection after death, and when finally on all these accounts we consider how vague the objects must be that are aimed at in the treatment, and consequently how uncertain, how indiscriminate, how fruitlessly inert, how perniciously active, how unsuccessful, how fatal that treatment often is, it must be admitted that fever still presents to us a vast field, in the culture of which the difficulties to be overcome are not slight, and the most diligent labour that can be bestowed upon it may by no means be attended with a sure reward.

Of many branches of science it is truly observed that much time and labour are necessary to establish a single important fact; of some parts of medical science this is eminently the case, but perhaps of none is the observation so just as of that which relates to febrile diseases. It is remarkable how entirely the most distinguished physicians of all ages who have treated of this subject coincide in the feeling, that with regard to this important class of disease it is impossible in the short life allotted to the most aged to do any thing more than add a little knowledge to the common stock. If there be any foundation for this feeling it can only be by every man faithfully endeavouring to contribute what he may be able, be the amount ever so small, that that stock can speedily become large or ever become complete.

In bringing to this common stock my humble mite, that the offering may not be wholly worthless, I have confined myself as much as possible to the detail of the facts that have been observed, and the statement of the results that have been obtained from experience. By giving a connected view of the phenomena I have hoped that I might possibly assist the actual practitioner to form a more adequate conception of the disease and guide him to that particular remedy which experience shows to be best adapted to each of the more important affections he is likely to encounter. Out of the means furnished for the accomplishment of these objects by the receptacle of fever for this great metropolis I have endeavoured to select such specimens of the disease as will place before him a vivid and faithful picture of the most interesting aspects it assumes, and such a detail of treatment as will show what particular remedies afford the best chance of success in each type and stage, and in the most common and therefore the most important modifications they present. If I have at all succeeded in my aim he will find himself placed in a good measure in the same situation with myself; his attention will be directed to the same phenomena in the order in which they occur in the series, and hence he will have the like means of judging of the relations which these phenomena bear to each other, as well as of the accuracy of the analysis that has been at-

tempted of the more complicated, and the soundness of the inductions that have been made from a comparison of the whole.

The London Fever Hospital is capable of receiving sixty-two patients: in most seasons of the year its wards are full: often there are numerous applications for admission which cannot be received for want of room: there pass through the wards from six to seven hundred patients annually. Two physicians are attached to the institution under whose care the patients are placed alternately in the order in which they are admitted: there is one assistant physician whose duty it is to perform the office of the ordinary physicians when either of these may be incapable of attending, and there is besides a medical officer resident in the house. A history of each case, containing an account of the age, occupation and residence of the patient, together with as full a statement of the symptoms of the disease and of the order of their succession as can be obtained is entered in the journal by the resident medical officer. Each of the ordinary physicians attends daily and enters in his journal a daily report of each of his own cases. The resident medical officer goes round the wards twice a day, namely, early in the morning and late in the evening, to observe if any change requiring attention may have taken place in any patient; and if any such change be observed by the nurses during the interval between these visits they are reported

to him by the head nurse without delay; all such events with the modification of treatment they may have required are entered in the journals. Every case that terminates fatally is examined after death, and an account of the morbid appearances is entered in a book kept for the purpose. In this manner, in the progress of years a mass of facts accumulates relating to the statistics, the types, the symptoms, the causes, the dyagnosis, the pathology and the treatment of the disease, whether successful or unsuccessful, which both on account of the fulness and accuracy of the record and of the extent of the period it embraces, cannot but be of great value.

I am encouraged in the attempt to make this record, as far as it has yet gone, useful to the public by observing the feeling that prevails among those physicians who have studied fever with the greatest diligence, and who have contributed most to our knowledge of it, that it is a disease which is still little understood and the treatment of which remains extremely vague and uncertain. Perhaps there is no disease so little understood as the ordinary fever of this country and none by the mismanagement of which so much life is lost. Dr. Clutterbuck appears to me therefore to describe the situation of the physician to such an establishment as the Fever Hospital, not more candidly than truly when he says—"It becomes a duty incumbent on those particularly who have been placed in situations favour-

able for observing the disease, to give the result of their experience to the public, should it tend, in any degree, either to prevention or cure. The inquiry is by no means exhausted, considered either in a theoretical or practical point of view. There is still a want of uniformity of opinion among physicians regarding the nature of the present epidemic, as well as of fever in general: while, I am sorry to add, in practice we are not much better agreed;" and when he further adds;—"To ascertain these modifications" (that is the modifications which require a modification of treatment) "is the great desideratum, which nothing but the most cautious observation, aided by much time, and the joint efforts of numerous individuals can fully supply."*

The slightest glance at the history of the doctrines which have been taught relative to the nature and the seat of fever from remote antiquity, and more especially a consideration of the variety and even the contrariety of the received opinions respecting both, in the present day, but too clearly show that if the ancients were in error, there cannot be many points with regard to which the moderns are right, since there is scarcely one in which they are agreed. Further observation and investigation are therefore not yet superseded. There is as yet no uniformity of opinion among physicians even whether the pri-

* Observations on the Treatment of Epidemic Fever, &c. By Henry Clutterbuck, M. D. p. 3—9.

mary seat of the disease be in the fluid or the solid parts of which the body is composed. Scarcely is the most ancient doctrine respecting it of which we have any record, that it consists in a morbid derangement of the fluids, and that the excitement which attends it is the result of an effort of Nature to expel the poison received into or generated within the system, obliterated from the imaginations or banished from the reasonings of physicians. When indeed we see a patient in the latter stage of some of the forms of fever with his dark or leaden skin, pouring forth its peculiar and fetid exhalation; with his foul tongue, his offensive breath, his vitiated and almost putrid secretions and excretions, we can understand why this doctrine should have taken a firm hold of the human mind, and should have been able to maintain its ground through many centuries. Yet when the phenomena came to be observed with the accuracy with which we know that they were observed and recorded, and examined with the acuteness with which we have abundant evidence that some of the most powerful minds reasoned upon them, we may justly wonder that the order of the events, together with their great variety and opposite nature did not sooner suggest doubts of the accuracy of the theory and give to the inquiries of these celebrated men a new direction. But so far was this from being the case that when Hippocrates, considering the increased heat as the essence of fever, founded his

division of the varieties of the disease upon this principle, whence his *causus* or burning fever, his *leipyria*, or fever with the parts externally cold and internally hot, and his *epialus*, or mild fever, with a simultaneous feeling of heat and cold; when he ascribed these different forms of fever to the superabundance of one or other of the four humours, blood, phlegm, yellow and black bile, and considered the disease as the result of a contest on the part of Nature to expel the morbid humour, or to render it inert or harmless by the process of concoction, the mind of Galen so many centuries afterwards, was so well satisfied with this hypothesis, that his powerful genius contented itself with the mere amplification of the conjecture and the addition of similar conjectures of his own. Whence assigning the different sources by which a morbid heat, which he also considers as the essence of fever, may be excited in the body, he states "that the fevers thus produced are modified by the prevalence or putrefaction of one or other of the four humours of Hippocrates; that of the three kinds of intermittent the quotidian arises from the corruption of phlegm, the tertian from that of the yellow and the quartan from that of the black bile; that in whatever part of the body the heat begins it ultimately extends to the heart; that as soon as this happens the general commotion of the vessels commences, and that in this manner Nature is employed in ex-

erting her powers, endeavouring to assimilate the good humours to the parts which are to be nourished and to expel the bad, but that if at any time Nature is unable to expel all the morbid humour either from its thickness, its abundance or its tenacity, or from some obstruction of the passages, or from her own want of power, it will necessarily undergo putrefaction, if it remain long in the body, and produce the most fatal effects unless it be expelled by the process of concoction." And so many centuries after Galen wrote, Sydenham who brought to the study of medicine one of the most acute, upright and independent minds that ever adorned it, commences a work on fever, which for fidelity of observation, for graphic description, for accurate discrimination, for bold and yet cautious treatment, has been justly considered an almost perfect model, with the following extraordinary assumptions:—

"That reason dictates that a disease is nothing else than Nature's endeavour to thrust forth with all her might the morbific matter for the health of the patient; that seeing it has pleased God, the governor of all things, so to constitute human nature that it may be fitted to receive the various impressions that come from abroad, it must necessarily be subject to many diseases; that these diseases proceed partly from particles of air ill agreeing with the body, which having once insinuated themselves into it, are mixed with the blood, and affect the whole with

a morbific contagion; and partly from various ferments or putrefaction of humours which are detained in the body beyond due time, either because it was not able to digest them, on account of the incongruity of their quality, or to evacuate them on account of their bulk; that these circumstances being so nearly joined to the human essence that no man can clearly free himself from them, Nature provided for herself such a method and concatenation of symptoms as that she might thereby expel the peccant matter, which would otherwise ruin the whole fabric; that the plague, for instance, is nothing but a complication of symptoms by which Nature casts out the malignant particles, by imposthumes in the emunctories, or by some other eruptions, that were drawn in by the air; that the gout is nothing but Nature's contrivance to purify the blood of old men, and to purge the deep parts of the body; that when Nature requires the help of a fever, whereby she may be able to separate the vitiated particles from the blood, or otherwise expel them, either by a sweat, a looseness, or some kind of eruption, she accomplishes this object in the whole mass of blood, and that by a violent motion of the parts; that when this object is accomplished suddenly, either by the health or death of the patient, the disease is acute; when, on the contrary, the matter of the disease is of such a nature that it cannot have the assistance of a fever for the separation of it; or when this kind

of matter is fixed to any particular part, which is unable to exclude it, or when the blood is vitiated by the continual flow of new matter into it, in these cases, the matter being very slowly or not at all concocted, the diseases which proceed from such unconcocted matter are called chronic: that acute diseases proceed from a secret and inexplicable alteration of the air infecting men's bodies; that these diseases do not at all depend on a peculiar crasis of the blood and humours any otherwise than the occult influence of the air has imprinted the same upon them; that they continue as long as this secret constitution of the air and no longer; that they do not come at any other time; and that these constitute epidemic fevers; that, on the other hand, acute diseases arise from this or that particular irregularity of particular bodies, which, because they are not produced by a general cause, do not therefore invade many at once; that this species comes every year, and at any time of the year; and that these may be called intercurrent or sporadic, because they happen at any time during the prevalence of epidemics."*

That conjectures so gratuitous, and so utterly incompatible with the structure and functions of the animal frame, should at such distant periods of the world, under such different conditions of society, and in such different states of science so entirely possess

* Sydenham's Works, p. 1, 2, &c.

and satisfy the minds of three of the most extraordinary men that ever illustrated or extended any department of science, will appear the less wonderful when we consider that the doctrines relative to fever which displaced and succeeded these, originated in precisely the same error, and vary in their aspect only in conformity to the progressive advancement of general science. When the structure of the animal body became more generally studied; when the functions performed by its different organs became better understood; when the morbid actions constituting or resulting from the derangement of these functions became more closely investigated, the influence of the nervous system and the effects of vascular action, began to form the subjects of investigation, and from this period the attention of physicians was fixed less upon the fluid than the solid parts of the frame. The properties and motions of the fluids were now clearly seen to be dependent upon the action of the containing solids, and the action of the solids to be under the influence and control of certain laws peculiar to life. Disease, studied under this juster view of the animal economy, immediately assumed a new aspect, and theories arose so much more consonant to the known operations of the living body, so much more explicit in their language and intelligible in their nature, that the ancient doctrines were at once exploded, and the very terms in which they were expressed became

suddenly, though, as it now appears, only for a short time obsolete.

Cullen, building upon the foundation laid by Hoffman, rivalling in the number of his pupils, and exceeding in the brilliancy of his success, if not in the perpetuity of his fame, any name of antiquity, achieved with unexampled ease and suddenness this great revolution; and in opposition to the ancient theories taught, that the first change induced in the animal system, by the operation of the exciting causes of fever, is a diminution of the energy of the brain; that all the powers of the body and all the faculties of the mind, that the functions of sensation and motion, the processes of respiration, circulation, and secretion, all fail or are diminished in the general debility; that after a certain time a morbid increase of some of these functions, especially of the circulation, takes place with an augmentation of the heat; that these three states, that of debility, of cold, and of heat, bear to each other the relation of cause and effect; that the first state is the result of the sedative or debilitating influence of contagion, marsh miasmata, cold or any other exciting cause, and the subsequent states the result of the first; that the debility produces all the phenomena of the cold stage, and especially a spasmodic constriction of the extreme arterial vessels; that this spasm or atony of the extreme vessels exists not only on the first attack of the cold stage, but remains during the

whole subsequent course of fever; that the spasm of the extreme vessels throws a load of blood on the central parts of the circulating system, which proves a source of irritation to the heart and arteries, and excites them to a greater action; that this increased action, the source of the heat and the other phenomena which constitute the second or hot stage continues till the spasm is relaxed or overcome; and that this excitement of spasm for the purpose of producing the subsequent reaction is a part of the operation of the *vis medicatrix naturæ*, the innate preserving power of the constitution. "Upon the whole," says this celebrated theorist, "our doctrine of fever is explicitly this. The remote causes are certain sedative powers applied to the nervous system, which, diminishing the energy of the brain, thereby produce a debility in the whole of the functions, and particularly in the action of the extreme vessels. Such, however, is at the same time the nature of the animal economy, that this debility proves an indirect stimulus to the sanguiferous system; whence, by the intervention of the cold stage, and spasm connected with it, the action of the heart and large arteries is increased, and continues so till it has had the effect of restoring the energy of the brain, of extending this energy to the extreme vessels, of restoring therefore their action, and thereby especially removing the spasm affecting them: upon the removing of which, the excretion of sweat, and

other marks of the relaxation of excretories take place."*

Whatever may be thought of the superior power of the theory of Brown, the pupil and rival of Cullen, to explain the general phenomena of the living body, whether in a state of health or of disease, the doctrine of the pupil relative to fever, differs in no essential respect from that of the master. Like his predecessor, Brown attributes all fevers to debility; and affirms that the distinctions which physicians have made about the differences of fever are without foundation; that they are all the same, differing only in degree; that the debility during the cold stage is the greatest; that of the hot less; that of the sweating stage which ends in health for the time, is the least of all: hence in a mild degree of the disease, as cold is the most hurtful power, its effect is gradually taken off by the agreeable heat of the bed or of the sun, and the strength thereby gradually drawn forth; that the heart and arteries gradually excited by the heat acquire vigour, and at last having their perspiratory terminations excited by the same stimulus, the most hurtful symptom is thereby removed, the hot fit produced, and afterwards the same process carried on to the breaking out of sweat; that the cause of all these diseases, from the simplest and mildest intermittent to the gaol fever and the

* Cullen, First Lines, S. 46.

plague is the same with that of diseases not febrile, to wit debility; differing only in this, that it is the greatest debility compatible with life, and not long compatible with it."

This very year, from Dublin, from the largest hospital for the reception of fever in the British Empire, precisely the same doctrine has been put forth. "Common epidemic fever," says Dr. Stoker,* "especially when cantagious, as I have frequently asserted when speaking of its pathology and treatment, has not appeared to me at any time to be essentially inflammatory. Adynamic fever, a denomination for typhus fever, which I shall employ, as I have hitherto done to express the putrid or malignant fever of Sydenham; the slow nervous fever of Huxham; the nervous fever of common language; the synochus, typhus mitior, and gravior of Cullen; the gaol and hospital fever; the *fièvres essentielles* of the French; the epidemic of the Irish writers; the contagious of Bateman; the typhus of Dr. Armstrong; and the proper idiopathic, or essential fever of Dr. Clutterbuck: whether it exists separately or independently; or is combined with any of the other forms of febrile disease, sporadic or symptomatic."† "Typhoid or adynamic fever I consider to be generally symptomatic of morbid changes in the physical

* Pathological Observations, Part II. on Continued Fever, &c. By W. Stoker, M. D. p. 32.

† Ibid. p. 34.

characters of the blood, and have, as on former occasions, stated what those morbid changes are—but I have arranged inflammation under the head of symptomatic fever, merely because it is more usually connected with some change in the structure of parts, discoverable after death: on the other hand, typhus fever is connected with morbid changes, that *primarily* take place in the fluids, and produce morbid actions, and sometimes permanent changes of structure in the said parts. These changes too in the condition of the blood are distinguishable from those which we have stated to occur in inflammation; and the morbid actions excited relatively by those changes in the blood are also distinct. In inflammatory fever on the one hand, increased action, in typhoid fevers on the other, debility, is almost the immediate consequence. On account of this debility being an essential character of typhoid fevers, I denominated them adynamic."*

At the close of the last season, in a work,† the materials of which have been drawn professedly from the London General Hospitals, doctrines so similar have been laid down, that Dr. Stoker says of it—"the views taken, both of the nature and treatment of fever, by Dr. Burne, entirely accord with those which may be found stated in my

* Pathological Observations, &c. pp. 73, 74.

† A Practical Treatise on the Typhus or Adynamic Fever, by John Burne, M. D.

Medical Reports from the Fever Hospital, as well as in my separate Essays on that subject. And as (when speaking of his denomination of fever) I have already remarked, this leaves, I think, no reasonable doubt of the epidemic fevers of London, having lately become more typhoid or adynamic, than they had formerly been. It is further satisfactory to me to find, that the treatment which I had long since adopted and recommended in our typhoid fevers has been found suitable to the prevention and cure of those in London; and that too in proportion as they have acquired more of that form, with which I was best acquainted."* And Dr. Burne himself states, "that the adynamic fever has no local seat; that its nature is *a morbid condition of the blood*, produced by the operation of the primary cause, the respiration of a contaminated or poisoned atmosphere: that this morbid blood, acting on the brain and nervous system, is of itself sufficient in very many instances to bring about the very great derangement and imperfect performance of all the functions of the organic and of the animal life; which great derangement and imperfect performance of all the functions constitute the phenomena of adynamic fever."†

Instead of regarding with these authors a vitiated state of the blood as the essence of fever, Dr. Clanny,

* Pathological Observations on Continued Fever, &c. p. 110.

† Practical Treatise, &c. p. 161.

on the contrary, believes its proximate cause to be a want of power in the system to form blood. "The proximate cause of typhus fever," he says, "is a cessation of chylification, and consequently of sanguification, during which time the lymphatics of the whole system act with increased vigour, and in this manner the lymph taken up by them from the system supplies, for the time being, the place of the chyle in the blood, and as long as this state continues the patient labours under an acute disease, heretofore called typhus fever. When the chylopoietic viscera resume their functions the disease gradually recedes, and health is ultimately restored."* "Chylification, like secretion, is a function of the brain, which under peculiar circumstances, or states of the atmosphere, is impaired, and in severe cases is suspended altogether: hence typhus fever."†

Such are the leading opinions of those who maintain that the seat of fever is in the fluids, in which opinions we perceive a return to the old doctrines, although in the modern version, it is true they are somewhat modified and presented in a somewhat more definite shape.

But in direct opposition to all such views of fever, it is zealously and ably maintained by a large and increasing sect, that this malady is strictly a local

* A Lecture upon Typhus Fever, by W. R. Clanny, M. D. p. 12.
† Ibid. p. 16.

disease; that it has its primary and essential seat in one organ, and that it consists of inflammation of that organ. Thus Dr. Clutterbuck, who may be regarded as one of the most distinguished advocates of this opinion, in one of the best works which has ever appeared on the subject, contends that fever of every denomination and every degree is the result of inflammation; that the appearances which have led to the conclusion that it is a general disease primarily affecting every function of the body are fallacious, and that, when strictly examined, it will be found that all general or extensive derangements of the system, are referrible to local disease in one organ. "Fever, in regard to its effects on the system," he says, "is the most general of all diseases, and gives rise during its progress to the greatest variety of symptoms. These, contemplated in the mass, present nothing but confusion. Like all complicated phenomena, they require to be subjected to strict analysis; that their order may be traced, and their relation to each other and to the exciting cause shown. To the neglect of this may be ascribed the error, as I conceive it to be, which has been so generally fallen into, of considering fever as an universal disease, or one that affects for the first time the whole system; no one part being supposed to suffer necessarily before the rest. Whereas, when the disease is minutely scrutinized, and its first appearance accurately noticed (which indeed from the

slightness and consequent neglect of the first symptoms is rarely done) it will be found to be strictly a *topical* affection, the general disorder of the system being merely *secondary*, or symptomatic of this."* In another work it is further stated, that all the varieties of idiopathic fever, which differ but in degree, as well as those which arise from specific contagion, as malignant sore throat, scarlet fever, small-pox, and so on, arise from one and the same affection of one and the same organ, and that that affection consists essentially in inflammation.

A similar doctrine has for some time been taught in France by a man whose disciples have already spread over every country in Europe, and are fast diffusing themselves over the new world, and whose devotion to their master and his system, reminds us of days long past, when the attachment of the pupil to the sage was as reverential and as enthusiastic as that ever paid by true knight to lady-fair in the brightest days of chivalry. "Penetrated by the sublime views of Bichat as to the sympathies," say M. M. Coutançeau et Rayer, two of the most ardent disciples of this school;† "rich in numerous facts observed with a rare sagacity, M. Broussais came to overturn, from the very foundation, the antique

* Observations on the Prevention and Treatment of the Epidemic Fever, by Henry Clutterbuck, M. D. p. 5, 6.

† See a paper in the Medico-Chirurgical Review, for 1828, entitled An Eclectic Review on Fever.

edifice of fevers. In his works as well as in his lectures, he has applied himself, for many years, to demonstrate, that the fevers which had been called essential, were nothing more than local diseases, inflammations, nay even gastro-enterites."

These writers go on to state that, according to Broussais, all fevers are of the same nature, those termed malignant differing from other fevers only by the violence and danger of their congestions; that all the causes of fever act locally; that, considered in a general and abstract manner, fever is invariably the result of a *primitive or sympathetic irritation of the heart* through the effect of which its contractions are quickened, and that every irritation sufficiently intense to produce fever is an inflammation.*

* Broussais' exposition of his own doctrine in his own words is as follows. On doit regarder comme nécessairement affectés, dans une maladie, les tissus dont l'irritation est constante durant la vie, et qui en offrent toujours des traces après la mort. Or, les phénomènes de la sur-excitation des muqueuses, et surtout de la gastrique, ne manquent jamais, dans le typhus fébrile, puisque leurs symptômes sont identiques avec ceux des gastro-entérties sporadiques; tandis que ceux des autres phlegmasies ne s'y montrent qu'accidentellement. Ensuite, lorsque les personnes affectées de typhus ont le malheur de succomber, on trouve toujours ces membranes rouges, brunes ou noires, pendant que les autres tissus n'offrent d'alteration que dans certaines circonstances accidentelles: donc l'irritation des membranes muqueuses est inséparable du typhus fébrile.

Les typhus fébriles sont donc des gastro-entérites, ordinairement compliquèes de catarrhes pulmonaires; ces deux phlegmasies sont le

There is thus a perfect accordance in the doctrine of these two celebrated and rival theorists, Clutterbuck and Broussais, respecting the nature of fever: both are agreed that it is an affection of the solids of the body and that its essence consists in inflammation: both are agreed that that inflammation is strictly local, being seated in one organ: but in determining what that organ is, there is an entire discrepancy in their opinion. According to Dr. Clutterbuck the organ universally affected in every variety of idiopathic fever is in the brain. "Out of fifty cases," he says, "of which I noted down the

le résultat d'un véritable empoisonnement, plus ou moins analogue à celui des champignons et des poissons gâtées, et qui en a tous les caractères.

Le foie, principal annexe du canal digestif, est irrité secondairement, et sa sécrétion est plus ou moins augmentée. Plus le miasme est actif, plus cette lésion est marquée le typhus carcéraires plus la chaleur est intense, plus l'irritation du foie est inflammatoire (la fièvre jaune.)

Le cerveau n'est inflammé primitivement que par l'effet de certaines circonstances qui ont fait prédominer l'action dans son tissu ; telles sont les affections morales, la nostalgie, les chaleurs, etc.; mais il souffre toujours beaucoup par sympathie et quelquefois au point que son irritation passe au degré de la phlegmasie, et devient aussi grave que si elle était primitive.—*Examen. de la Doctrine Medicale, par F. J. V. Broussais*, p. 112—114

Il n'y a de difference entre les gastrites qui sont ici dépeintes et ces fiévres, que celle qui dépend du degré; car les gastrites aigües qu'on ne peut pas arrêter arrivent toujours ou à l'ataxic ou a l'adynamic, dont les symptômes ne different pas de ceux du typhus. D'ailleurs, las gastrite dont il est ici question est déjà pour les ontologists, une fièvre ataxique.—*Histoire des Phlegmasies, par F. J. V. Broussais, Vol.* III. p. 39.

symptoms with the greatest minuteness at the bedside of the sick, generally once and often twice in the twenty-four hours, throughout the disease, I find that no two of them correspond in the minute points though they all agree in the essential one, that is, in a manifest affection of the brain and its functions; various in degree and probably in extent, with numerous but accidental complications, from the affection of other organs."* This affection of the brain, consisting of inflammation, it necessarily follows, as this author elsewhere states, that fever is nothing else than a species of phrenitis, or topical inflammation of the brain; that it might, therefore, be arranged in the order of phlegmasiæ with pleurisy, enteritis, and other symptomatic fevers, but that since the term phrenitis has been generally applied to a particular form of inflammation of the brain and implies delirium, which does not always occur in fever, although it is a frequent symptom, that of encephalitis would form a proper denomination for this entire class of diseases, and might be substituted for the term fever.

Broussais, on the contrary, contends that the primary and essential seat of inflammation in fever is the mucous membrane of the stomach, or of the intestines, or both, but especially the former, and that, therefore, the proper designation of it is *gastro-*

* Observations on the Prevention and Treatment of Epidemic Fever, &c. pp. 11, 12.

enteritis. While it had long been conceived that inflammation of the digestive organs is the cause of certain symptomatic fevers, Broussais maintains that the most important discovery (most important because so intimately connected with the treatment of the disease) that this affection is the cause of all fevers, idiopathic as well as symptomatic, and that there are in fact no essential fevers, is peculiarly and exclusively his own. Thus, according to this theorist, all the fevers of authors are connected with gastro-enteritis, simple or complicated. "The simultaneous or successive inflammation of the stomach and small intestines, designated by this term," says M. Rayer, "is of all the phlegmasiæ the most frequent, and at the same time that which has been oftenest overlooked or mistaken. It is not designated in any nosological table. Not long ago gastritis itself was generally looked upon as a very rare disease: of twenty-eight thousand two hundred and ninety-nine sick admitted into the civil hospitals of Paris in 1807, six only were designated in the returns as labouring under inflammation of the stomach, whilst six thousand one hundred and forty-three were treated for continued or remittent fevers."

The prevailing doctrines relative to the nature and seat of fever at present then are two, the direct reverse of each other; one, that it is a general disease affecting the entire system; that this affection of the system consists of debility which is manifested first

in a loss of energy of the brain, but which rapidly extends to every organ and every function, and that consequently *the absence of any primary local disease,* ought still to form, as it has so long formed, an essential part of the definition: the other, that it is in the strictest sense a local disease; that its primary seat is invariably fixed in some one organ; that the affection itself consists of inflammation; and that that inflammation is seated, according to one opinion in the brain; according to the other in the stomach.

As must necessarily be the case, these different and opposite theories are found to have the most important influence on the practice recommended by their respective authors in the treatment of the disease. The advocates of the first deprecate all active interference: the grand evil to be contended with is debility: the physician can easily weaken, but he cannot easily strengthen: he can depress to any extent he desires, but he cannot communicate power as he wishes. In a malady therefore of which the very essence consists in loss of energy the main duty of the physician is to husband the strength of the patient with the most anxious care, this being the chief means, as Cullen expressively termed it, of obviating the tendency to death. The important inference is, that every kind and every degree of depletion that can add to the primary cause of the malady, must be abstained from with the utmost

caution. By the clearest and shortest deduction this will necessarily be the result to which every mind must come that really believes that debility is the essence of fever, while he who admits its inflammatory nature must think it criminal to stand idle by and allow the most extensive derangements in the structure of vital organs to proceed, without even an attempt to check them, as long as it is in his power to use the lancet or to procure leeches. The very order in which the believers in debility enumerate the remedies they recommend affords a striking illustration of the extent to which their theory influences their practice;* while the advocates of inflammation state explicitly that the remedy of the disease is one, and in point of importance one only, namely, the remedy which all admit to be the only efficient agent in the treatment of inflammation.

* Thus Dr. Stoker states that the remedies "may be arranged according to their relative importance in the treatment of fever, in the following order; viz. In mixed fever. 1. Cleanliness. 2. Ventilation. 3. Cool regimen. 4. Plentiful dilution. 5. Purgatives. 6. Topical bleeding. 7. Antimonial or James's Powder. In Typhoid Fever. 1. Yeast or barm. 2. Wine. 3. Aperients. 4. Emetics. 5. Blisters. 6. Tepid or cold affusion. 7. Peruvian bark."—*Pathological Observations, &c. p.* 111. In neither of these catalogues is general bleeding mentioned at all: in the first, topical bleeding is mentioned, but it is placed the last but one in the list, while in the second, allusion even to topical bleeding is wholly omitted. And Dr. Clanny states that the first proposition relative to the cure is how to restore sanguification, or how to afford fresh chyle to the blood; that although in full habits, at the commencement of typhus fever, general blood-letting is often attended

"Fever to be treated successfully," says Dr. Clutterbuck, "must be treated upon the general principles of inflammation; but at the same time with the modifications arising out of the peculiar nature of the organ affected, and in some degree also the nature of the exciting cause. Blood-letting, which but a few years ago was looked upon with abhorrence in the cure of contagious fever, and the utility of which is still far from being generally appreciated, is proved by ample testimony to be not only the most powerful, but the safest of remedies." And in every variety of fever, and in all its stages, leeches are to be applied to the stomach, according to Broussais, and scarcely any thing else is to be done except enjoining rigid starvation. Emetics, purgatives, bark, wine, are all denounced; nothing but leeches and "diete absolue:" a costive state of the bowels persisting during five or even ten days is a good symptom and not to be interfered with.

with good effects, yet we should remember that if we take one ounce too much, we may thereby prevent sanguification altogether; that therefore it is better to have a sufficient quantity of lymphatic blood in the system than to run the risk of having too little of the pabulum vitæ, for the purpose of carrying on the functions of life, and that in fact venesection is not called for in nine cases out of ten of typhus fever. Let me caution young practitioners, he adds, against the repeated use of the lancet, when the buffy coat shows itself, for in many cases, which have come under my notice, I have observed the buffy coat to be present after repeated bleedings, AND WHICH COULD NOT BE ATTRIBUTED TO ANY OTHER CAUSE THAN DEBILITY.—*Lecture on Fever, p.* 21-2-3.

That men who exhibit such talent for observation and such acute and active powers of the understanding as many of these authors exemplify in these very works, should, while writing with so much earnestness against each other, fall into one and the same error, and that an error so palpable, is no flattering exhibition of the state of the art of reasoning among the members of the medical profession. The degree in which the science of mind is neglected in our age and country, may it not be justly added? especially in our profession—that science upon the knowledge of which the conduct of every individual mind is so dependent, is truly deplorable. Medicine is an inductive science, the cultivator of which is peculiarly exposed to the danger of making hasty assumptions and of resting in partial views, yet it is not deemed necessary that he should be at all disciplined in the art of induction, or should be cautioned against any sources of fallacy in the practice of making inferences. All the partial and imperfect views of fever which have now been brought before the eye of the reader, originate in one or other of the following errors, obvious as they all are: either that of assuming as a fact what is merely a conjecture; or that of assigning to the genus what belongs only to the species; or that of characterising the disease by what appertains only to a stage; or that of mistaking the effect for the cause. On careful examination it will appear that one or other of

these errors, which are as serious as they are palpable, has vitiated in a greater or less degree every generalization of fever that has hitherto been attempted.

Thus the believers in debility derive their notion of the whole disease from the phenomena which occur in the first and the last stages only: in these, it is true, they may find abundant evidence of debility: but then they overlook the intermediate stage in which there are generally the most unequivocal indications of increased sensibility in the nervous and increased action in the vascular systems: in this manner they characterize the disease by what appertains only to certain stages of it. Again, when they contend that debility is not only the essence of fever in general, but is really characteristic of every type of it, they affirm what is indisputable of fevers in particular seasons, in particular climates or in particular constitutions; but beyond this their generalization cannot be extended: in this manner they assign to the genus what belongs only to the species. And when Cullen goes on to affirm that the proximate cause of all the morbid phenomena is a "spasm of the extreme vessels," he commits the additional and more palpable, but not less common error, of assigning as an undoubted fact, as a real and ascertained occurrence, what is only a conjecture, and for which there is not, and for which he does not even attempt to adduce the shadow of evidence.

Precisely similar to this is the error of those who for the most part belong to the same school, and who attribute the essence of fever to a morbid condition of the blood. The blood may be diseased in fever, but if it be so, these writers do not *know* it, or at least they do not adduce any evidence that they are in possession of such knowledge: they do not appear so much as to have questioned chemistry; at all events, it is certain that they have hitherto received no satisfactory answer. There is no evidence on record that the alleged determination of the blood takes place in every type and every degree of fever: and if there were it would still be but one event among many, and one that occurs late in the series, and therefore could possibly be nothing more than an effect.

In like manner those who maintain that inflammation of the brain is the sole cause of fever, assume as an established and admitted fact the universal and invariable existence of inflammation of the brain in this disease. Inflammation of the brain, without doubt, is demonstrable of many individual cases, and of some whole types: but beyond this there is no proof that the generalization can be carried: the evidence indeed in regard to many cases is entirely against the assumption, and is as complete as negative evidence can well be: consequently it must be admitted that even this hypothesis, in the present state of our knowledge, is founded on the error of assigning

to the whole genus what belongs only to particular species: and it would be trifling with the reader to attempt to prove, that this is still more certainly and strikingly true with regard to inflammation of the mucous membrane of the stomach and intestines—an affection which in innumerable cases in which its existence is certain, clearly appears on the slightest examination of the succession of events, to be an effect and not a cause.

No comprehensive view can be taken of fever, no just conclusion can be arrived at relative to its nature and seat until it be studied with a consciousness of the liability to such errors and a vigilant endeavour to avoid them. The present investigation has been undertaken with a deep consciousness of the danger and a watchful and unremitting care to avoid it. Even if the effort prove to be without success, the example can scarcely remain without use.

The frequent and formidable disease on the investigation of which we are entering, cannot be understood until clear and exact answers are obtained to the following inquiries. 1. What is the series of phenomena which constitutes fever? 2. What are the particular phenomena which are common to all its varieties and combinations? 3. What is the order in which these phenomena occur in the series? 4. What are the organs, and what their states, upon which these phenomena depend? 5. What are the external signs of these internal states, or what

are the indications by which their existence may be known? 6. What is the external noxious agent or agents, or the exciting cause or causes of the disease? 7. What is the particular remedy, or the particular combination of remedies which is best adapted to each state of each organ? When these questions can be clearly and perfectly answered, and not till then, we shall know the disease and its treatment. In order to make any real progress in this knowledge we must therefore prosecute these inquiries. It appears to me that we are already in possession of ascertained facts, adequate to answer with a high degree of certainty, though perhaps not with absolute certainty, several of these questions. In keeping these inquiries steadily before our view in our investigation there will be this great advantage, that it will enable us clearly to perceive what we really know and what still remains to be ascertained.

The phenomena which constitute fever, like those which belong to all the processes of nature, consist of a certain number of events. The events which take place in this disease are before our eyes: they are abundantly familiar to us all: no one man indeed has seen all the forms of fever which exist, nor observed all the symptoms of those species which he has witnessed, but accurate records are to be obtained of them all: records upon which we have this assurance that we may rely, that all the

important events in this disease are so obvious and striking, and indeed force themselves so powerfully and constantly upon the notice, that there can be little danger that any one of consequence should be overlooked. Accordingly medical writings abound with the most minute, and, as far as can be judged, accurate histories of the symptoms which accompany all sorts of fevers, whether epidemic or sporadic. It is not in the observation of symptoms that the danger of error lies, because these are matters of sense, but the danger arises from a different source. Supposing, for example, that all the important events which accompany all the important varieties of fever have been ascertained, and that thus our first inquiry relative to the series of phenomena which constitutes the disease, is answered, still as many of these events are observed to be often absent, while it cannot be doubted that fever is nevertheless present, we must necessarily inquire in the next place, what is that particular combination of events which is *essential* to the constitution of the disease, an inquiry which embraces the second question proposed for consideration, namely, what are the particular phenomena which are common to all the varieties of fever? Now in singling out this particular series of events from the great mass, we are liable to several sources of error. In the first place, we may stop too soon in our enumeration; in the second place, we may mistake the

adventitious for the essential and the essential for the adventitious, and in the third place, we may overlook the real place which some particular event holds in the series, and so may suppose that to be antecedent which was truly sequent, and consequently assign that as a cause which is only an effect.

The first thing to be done then is to ascertain the concourse of symptoms, and the second, to determine the order in which they occur: when these two points have been made out, what is essential and what adventitious, as well as what is the cause and what the effect, become at once clear and certain. But the difficulty lies in discerning amidst the infinive diversity and contrariety of symptoms which the different modifications of fever present, when we may safely assure ourselves that we are in possession of all the essential phenomena. Our guide is *invariableness* of concurrence. If we can ascertain that a certain number of events *invariably* take place in every form and every degree of fever, these events will give us the particular phenomena which are common to all the varieties of the disease. If we can further ascertain that these events *invariably* concur in a certain order, we shall have discovered what events bear to each other the relation of cause and effect. And the establishment of this relation of events, this constant connexion with each other, this uniform antecedence and sequence appears to

me to be the only theory after which it is consistent with the principles of sound philosophy to search. If I have endeavoured to establish this connexion, and have thus ventured, as I conceive, in a strictly philosophical sense to propose a theory, in doing so, I have carefully restricted myself to the attempt to deduce a legitimate conclusion from facts previously ascertained. It does appear to me that these three points, namely, the common phenomena, the invariableness of their occurrence, and their mutual relation are satisfactorily established. Whether I shall be able to communicate this conviction to the reader I do not know: but I hope he will at least coincide with me in opinion that this mode of investigating the disease affords us the best chance of arriving at satisfactory results.

Whatever be the phenomena of fever they depend upon certain states of the organs. Whatever be the noxious agents or the exciting causes of the disease, and however they operate, they can induce the disease only by bringing about a certain condition in a certain number of organs, the individual events constituting the disease being nothing but certain changes in these organs. It is therefore of paramount importance to ascertain what the organs are which are implicated; what the conditions are which are induced in them; what organ sustains the first assault and what organs are attacked in succession. The pathology about to be laid before the reader

will demonstrate the first two points: the establishment of the last two will be attempted by an examination of the history of the cases.

Without doubt the life or death of the patient depends upon these conditions of the organs. In a practical point of view therefore, this is the kind of knowledge with which it is of the greatest importance that the practitioner should be familiar. Some of these conditions are indicated by certain signs during life: some of these indications are obscure, and may be easily overlooked or mistaken by those who have not acquired an accurate and extensive acquaintance with the disease. On the other hand, there are external appearances which are extremely apt to suggest a false notion of the state of the internal organs. These fallacious appearances are sure to lead those whom they deceive into a mistaken, often into a mortal practice. Certain conditions of vital organs, if allowed to remain long, will terminate in fatal changes of structure. Certain remedies, if applied in due season and with due vigour, are capable of removing those conditions. Life therefore must sometimes depend upon the power of making this diagnosis with accuracy. Of some of these conditions, the diagnostic marks are clear and certain; those which indicate other conditions, in the present state of our knowledge, are obscure and uncertain. I have thought no labour too great to put the reader in possession

of all that I have been able to ascertain with regard to this most important part of the subject. In the attempt to communicate this information, I am conscious that I may incur the charge of tediousness, on account of the number of repetitions which occur, and which I have allowed to remain because I could see no means of removing them without sacrificing clearness to brevity. Elegance and conciseness, in a work of this nature, ought not for a moment to be considered if they endanger its practical usefulness. A knowledge of the condition of the internal organs, in fever, can alone guide us to a rational and successful treatment of this most dangerous disease. It is only by examining the body after death that we can acquire this information: it is only by observing the symptoms during life and comparing them with the morbid appearances after death, that we can discover the signs which indicate the existence of these states. For these reasons I have not hesitated to give numerous cases and to detail many dissections. If after the study of these cases and dissections the practitioner be enabled at the bedside of the fever patient to discover with greater precision and certainty than heretofore the condition of the brain—the condition of the lungs—the condition of the intestines, he will not think the time he has devoted to the investigation ill spent, nor shall I think myself without reward for the labour it has cost me to draw up the record. It is only

when from external appearances we are able to see what is going on within each of the great cavities of the body, as clearly as we should do if their walls were transparent, that our interference can be sure of doing good, or secure from doing mischief: it is this kind and degree of knowledge alone which can teach us both when to act and what to do; and what is of almost equal importance, when to stop and to attempt nothing; and if the perusal of this work should contribute in any measure to the attainment of this knowledge, I shall not have laboured wholly in vain, "to add something to the treasury of physic."

CHAPTER II.

Varieties of Fever. Common Phenomena. Importance of this Analysis. Results of the Analysis. Organs always diseased in Fever: Functions always deranged in Fever. Fever not Inflammation: Distinction between these two states of Disease. Common Phenomena of Fever exemplified in Plague, in Yellow Fever, in the Varieties of the Fever of our own Country. Different Varieties produced by different Intensities of the same Affections. Received Classification and Nomenclature defective. What is really meant by Genera and Species of Fever. True Principle of Arrangement.

Fever is a genus consisting of several species, and each species presents many varieties. The external characters of these varieties and the internal states upon which they depend, are so opposite, that no two diseases in any two parts of the catalogue of nosology present a more diversified appearance, or require a more varied treatment, than may be the case with two different types of fever. The fever of one country is not the same as the fever of any

other country; in the same country, the fever of one season is not the same as the fever of any other season; and even the fever of the same season is not the same in any two individuals. Many of the circumstances which constitute these varieties in the fevers of different seasons and of individual persons, are slight and trivial; but some of them are of the greatest possible importance, and those diversities, especially, which distinguish the fevers of different climates, are intimately connected with the causes, whatever they be, which render the disease mild or severe, and, consequently, comparatively innoxious or fearfully mortal.

Something there is, however, which, amidst this astonishing diversity, preserves the identity of the disease so completely and so obviously, that there never has existed any dispute about that identity, under any aspect which it has hitherto been observed to assume; so that all physicians, without exception, unhesitatingly accord the name of fever to the mildest form of the common fever of this country, to the yellow fever of the West Indies, and to the plague of Constantinople and of Egypt. Bring three persons, each exhibiting an exquisite specimen of one of these several forms of the disease into the same ward of an hospital, the external aspect presented by each would be so different, that an unprofessional observer would probably be able to discover in these modifications of the same malady

no common property: yet there is no physician who would not, in each case, instantly pronounce the disease to be fever. There must, therefore, be something that establishes the identity of the disease under this diversity of aspect. What is that something? Whatever it be, it must be common to all the varieties of fever. Thus we are led at once to the second inquiry which we proposed to keep before us in this investigation, namely, what are the particular phenomena which are common to all the varieties and combinations of the disease?

The importance of making this analysis has been felt by every person who has directed his attention to this subject from the remotest antiquity down to the present time. That it is not as easy to be made as the necessity of it is plainly to be perceived is abundantly attested by the want of success which has hitherto attended the efforts to perform it of the acutest minds, and the acutest minds, the pride and boast of our science have applied themselves to the task. Notwithstanding their labours however, the analysis made by Hippocrates has been received through succeeding ages with little variation, and continues to be received even in modern times with only slight modification. And yet that reflecting men of every age have not been satisfied with resolving all the essential phenomena of fever into heat, although they have all consented to designate the dis-

ease by some term expressive of that property,* is attested by proofs no less striking than instructive. We are informed by Van Swieten, that Boerhaave collected with much labour from a great variety of authors all the symptoms which they had observed in different fevers: that from these he threw out such as did not appear in all fevers, and that finding himself obliged to exclude one after another, he was at length greatly surprised to find the catalogue so short; it being ultimately reduced to three; namely shivering, frequent pulse, heat.

This is a sufficient and an interesting proof that this illustrious physician saw the importance of making the analysis in question; it shows also, that his ingenuity suggested probably the best mode of conducting it which a philosopher sitting in his study could devise; and the only proper mode of conducting it the circumstances of his age and country did not place within his reach. Accordingly his success did not equal his labour: for out of the three phenomena which he fixes upon as those that are common to all the varieties of the disease there is not one which is invariably found in any type of it; while in innumerable cases the combination

* It is remarkable that the word which expresses fever, both in the Greek and the Latin languages, signifies to burn or to boil, and it is probable that this state of the system is denoted in most modern languages by some term bearing a similar meaning.

of the three is not found. Shivering does not occur in some of the worst forms of the malady; and where it does, it is confined to the commencement of the attack, or to that of its exacerbations. The pulse, instead of being always more frequent than natural, in some of the most formidable aspects assumed by the disease, has been observed to be as low as forty or even thirty in the minute, and, from the beginning to the termination of the attack, the heat in some cases is below the natural standard, as it generally is in the commencement of the cold stage.

To the catalogue of Boerhaave, Cullen makes the following additions:—"languor, lassitude and other signs of debility, together with derangement of the functions, particularly a want of vigour in the limbs without any primary local affection." This extension of the catalogue adds in no respect to the excellence of the generalization. It has all the vices which a definition can possess. The characters are not present in all cases; the very opposite are strikingly prominent in many, while the last, "without any primary local affection," has so direct a tendency to mislead the mind, and positively to prevent it from observing the real phenomena of the disease, that it may well be questioned, whether the introduction of this single phrase into the definition of fever, has not been the occasion of far more practical mischief than has been compensated by any good

that has been accomplished, or ever can be accomplished by all the rest of the nosology.

In the last attempt to improve the definition of fever with which I am acquainted, Dr. Wilson Philip says, "If we lay aside Dr. Cullen's term pyrexia, (which it must be borne in mind is precisely Boerhaave's brief catalogue) we shall considerably lessen the difficulty of giving such a definition of idiopathic fevers as shall apply to all cases. They may be defined as follows. Languor, lassitude, and other signs of debility, followed by a frequent pulse, and increased heat, without any primary local affection."* Inasmuch as this definition contains fewer words than that proposed by Cullen, it may be liable to fewer objections, but it is less faulty only because it is shorter.

This total failure of men, all of them of unquestionable acuteness, and some of them of splendid genius, in their attempts to discover the common phenomena of fever, affords a strong presumption that they have not pursued their object in the right path. Without doubt, before it is possible to succeed in any scientific investigation, it is necessary to form a distinct conception of the object of inquiry. Fever is not an entity, not a being possessing a peculiar nature; and the object of investigating it, is not to discover in what such nature consists, or what

* A Treatise on Fevers, &c. By A. P. Wilson Philip, M. D. p. 10.

it is that constitutes its essence: but fever is a series of events, and the object of inquiry is to discover what the events are; what the events are that invariably concur in the series; and in what order they constantly succeed each other. When we have discovered this, we have ascertained all that we can ever know of what is termed the nature of fever, as it is this, and only this, that we can ever know of any object or process. Every natural object consists either of one single substance, or of several substances united; and our knowledge of that object is complete when we have ascertained what that single substance is, or what all the separate substances are that combine to form it. Every natural process consists of a number of events, and our knowledge of that process is complete when we have ascertained the events themselves, the order of their succession, and the events to which they give occasion. We can make no real progress in knowledge unless we keep steadily in view the kind of information which it is possible to acquire, and which it is to our purpose to seek; and dispossess our minds of the phantoms which have so long enthralled and abused them.

In relation to our present subject then, the first object of inquiry is, what are the events which invariably concur in fever?

Where shall we look for the events? Not in the symptoms. Symptoms are not events: they are

only indications of events: symptoms depend upon states of organs: they are the external and visible signs of internal, and, for the most part, as long as life continues, invisible conditions. It is then to the state of the organs that we must look for the events of which we are in search.

Are there any states of any organs that always exist in fever? Are the states constant? Are the organs affected constant; and can both be ascertained? If this can be truly answered in the affirmative; if it can be proved that there are certain conditions of certain organs which invariably exist in fever, in every type, in every degree, in every stage of it, we shall have arrived at a satisfactory conclusion relative to the first part of our inquiry.

The evidence is as complete as observation during life and inspection after death can make it, that a morbid change does take place in a certain number of organs in every case of fever, from the most trivial intermittent to the most alarming continued fever, from the mildest plague to the most malignant typhus: that at the two extremes of this scale, and at all the intermediate gradations of it, there are certain organs which are always affected, and that the affection in all is similar.

The identity of the organs is inferred from the indications they give of disordered function during life: the identity of the affection is inferred from the similarity of morbid appearances which they exhibit on examination after death.

The organs affected are those which constitute the nervous system; those which constitute the circulating system, and those which constitute the systems of secretion and excretion. The spinal cord and the brain; the heart and the arteries, especially their capillary extremities; the secreting and the excreting organs, which in fact are composed, essentially, of the capillary extremities of the arteries; the secreting and the excreting extremities of these arteries, especially as they terminate in the external skin, and in the mucous membranes, which form the internal skin, this is the chain of diseased organs: derangement in the nervous and sensorial functions: derangement in the circulating function: derangement in the secretory and excretory functions, this is the circle of morbid actions.

There never was a case of fever in which all these organs and affections were not more or less in a morbid state: there never was a concurrence of this morbid state, in this complete circle of organs, without fever. The events which *invariably* concur in fever, then, are a certain deviation from the healthy state in the nervous and the sensorial functions; a certain deviation from the healthy state in the circulating function; a certain deviation from the healthy state in the functions of secretion and excretion. A deviation from the healthy state in one circle of actions will not present the phenomena of fever; a deviation from the healthy state in two

circles of action will not present the phenomena of fever: there must be a deviation in the three circles before fever can exist. Such then are the common phenomena of fever.

For obvious reasons the detail of the proof that these several events really and invariably take place, must be postponed until the phenomena themselves have been stated, or what is termed the history of the disease has been given.

But it is not the invariable concurrence of a particular number of events that is alone sufficient to constitute fever: to this must be added invariableness of concurrence in a particular order. As will be shown in the proper place, there is complete and irresistible evidence that these events do occur in one invariable order. Derangement in the functions of secretion and excretion never comes first in the series: derangement in the nervous and sensorial functions never comes last in the series: derangement in the function of the circulation never comes either the first or the last in the series, but is always the second in succession.

The order of events then is first, derangement in the nervous and sensorial functions; this is the invariable antecedent: secondly, derangement in the circulating function; this is the invariable sequent: and thirdly, derangement in the secreting and excreting functions; this is the last result in the succession of morbid changes.

Supposing the matter of fact to be as is here stated, and the proof that it is so will be adduced hereafter, it is clear that we are in possession of the true characters of fever. We know the events: we know the order in which they occur: we know therefore what it is that constitutes the disease, and we know consequently what it is by which it is distinguished from every other malady. No other disease exhibits the same train of phenomena in the same order of succession. In inflammation some of the phenomena are the same: but the order in which they concur is not the same; and this affords a clear and universally applicable mark of distinction between fever and inflammation. In inflammation there is similar derangement in the secreting and excreting functions: there is also sometimes similar derangement in the circulating function: but the derangement in the nervous and sensorial functions is seldom if ever similar: the derangement that does take place in these latter functions, while it is apparently different in kind, is certainly and invariably different in the order of its occurrence. In pneumonia, in enteritis, in hepatitis, the spinal cord and the brain are *never* the organs in which the *first* indications of disease appear: the earliest indications of disease that can be discovered have their seat in the affected organ itself: it is only after the disease has made some progress that other organs and functions are involved; and apparently, the

last to be involved, and certainly the least to suffer, is the nervous system.

We can now then answer the questions so often asked—are fever and inflammation the same? and if not the same in what do they differ? Fever and inflammation are not the same, because the term fever is appropriated to the designation of a certain number of events which occur in a certain series: the term inflammation, on the other hand, expresses another series of events, each event composing this train, succeeding each other in a different order: and the difference between the two series of events is precisely this difference in their individual phenomena and in their order of succession. What the physical and the physiological condition of the organs is, as contrasted with their condition in the state of health, has not yet been made out with regard either to fever or to inflammation: in the present state of our knowledge, therefore, we can neither affirm nor deny any thing respecting either the identity or the difference of that physical and physiological condition of the organs in these two classes of disease. What inflammation is beyond the series of events we are able to observe we do not know: what fever is beyond the series of events we are able to observe we do not know: we compare the events and we see that they differ: and since the use of names is to mark and to express differences, it is right to distinguish these different events by

different terms. But though in the present state of our knowledge we are not justified in considering fever and inflammation to be the same, yet the close, perhaps the constant connexion between them, is a fact of the utmost importance to be known, and requires to be incessantly before the view of the practitioner. And of this we shall have but too abundant evidence in the sequel.

Supposing the proofs hereafter to be adduced to be conclusive, that the events in fever and their order really are what has now been stated, how clearly and beautifully does this view of the disease enable us to recognize one and the same malady through all the modifications it undergoes, and therefore through the countless aspects it assumes. Out of the system of organs that are always affected in fever some may be more and some may be less diseased; and it is easy to see how, from this diversity alone, the utmost variety may arise in the external characters of the disease. Thus, at one time, the spinal cord and the brain may be intensely affected: consequently the patient may be seized with violent pains in the limbs; with ferocious head-ache; with early delirium, which may rapidly increase to such a degree of violence as to require restraint: or, on the contrary, all the muscles of voluntary motion may be seized instantaneously with such a loss of energy that they may truly be said to be paralyzed: at the same time the sensorial faculties may be over-

whelmed almost as completely as they are in apoplexy: thus may be formed one type of fever: and such a concourse of symptoms is actually found to exist: it ushers in the plague when it first stalks into a devoted city to sweep away its thousands and its tens of thousands.

At another time the disease may seize with peculiar violence upon the organs of secretion, and especially upon those which belong to the digestive apparatus: hence the liver may suddenly pour fourth an immense flow of bile, so vitiated in quality as to irritate and inflame whatever it touches, and so abundant in quantity as rapidly to diffuse itself over every part of the body, and to tinge almost every tissue and every fluid: at the same time the stomach and intestines may be involved in such acute disease that the powers of life may be exhausted in a few hours by incessant vomiting and unconquerable purging: thus may be formed another type of fever, and such a concourse of symptoms actually occurs in the yellow fever of the West Indies.

Now we may witness a severe though a less violent affection of the spinal cord and the brain than occurs in plague. There may be present great pain in the back and limbs; intense head-ache; early and violent delirium; a burning skin; a quick and strong pulse; urgent thirst, and constipated bowels: or, on the contrary, there may be not pain of the head, but giddiness; not delirium, but stupor; not a

burning hot, but a moderately warm or a cool skin; not a frequent and strong, but a frequent and feeble pulse. In either case we have a fair specimen of the common fever of our own country, the first forming the variety which may be termed acute, the second subacute cerebral.

Now again we may witness a concurrence of symptoms very similar to the latter in the commencement of the attack, only that there is from the beginning greater prostration of strength; and a rapid increase in the derangement of the nervous and sensorial functions: together with a brown and dry tongue; a tender abdomen, and dark and offensive stools: thus may be formed another type of fever to which is commonly assigned the name of typhus.

In each of these cases the most urgent symptoms have their seat only in one set of the organs that compose the circle which we have said to be involved; but in every case all the other organs included in that circle are as really, though not as intensely diseased. When the spinal cord and the brain are so violently affected that the patient appears to be struck with paralysis or apoplexy, the attention is not strongly drawn to the state of the mucous membrane of the digestive apparatus; to the nature of the secretions and execrations of which it is the source; to the temperature of the system, or to the condition of the circulation: because the affection of the nervous system being overwhelming,

and all the other affections being comparatively trifling, it is natural that the former should, in a manner, absorb the mind of the observer; yet, if the skin, the pulse, the tongue, the evacuations are examined, all will be found to be in a morbid state, and that morbid state will bear a certain proportion to the affection of the nervous system.

In like manner when the organs of the digestive apparatus form the strong hold of the disease, the morbid condition of the spinal cord and brain, and the altered action of the heart and arteries, may attract less notice; but that morbid condition will be not the less real, and will contribute its portion of disease to the general derangement of the system, not the less certainly because the indications of its existence may be less obtrusive.

And in the milder forms which the fever of our own country presents, in the most intense cerebral affection with which we ever meet, there will always be present unequivocal indications of deranged function both in the heart and arteries, and in the organs of secretion and excretion: while in cases in which the brain may be tolerably clear; in which there may be little or no head-ache; little or no pain in the limbs; no delirium; in which the disease may be chiefly seated in the mucous membrane of the stomach and intestines, and the prominent symptoms be, pain of the epigastrium, tenderness on pressure over the whole abdomen, a red tongue, and frequent

stools, still if we examine the state of the pulse, if we look at the quality and the distribution of the nervous influence, if we observe the operations of the sensorial faculties, we shall find these functions to be as truly, though not as intensely deranged as if the full force of the disease were spent upon the organs in which these functions have their seat.

Thus, although all these organs are invariably affected in every case of fever, yet in no two cases are all these organs affected in the same degree. Sometimes one system is more affected than another; sometimes one organ of one system, and these different degrees of affection, in these different systems, are variously combined and modified. How great then must necessarily be the diversity of symptoms presented by the different forms of fever! How incalculable are the varieties that result from difference of intensity alone. One degree of affection of the brain, for example, will occasion violent head-ache, constant watchfulness, great restlessness, a peculiar expression of the eye, and intolerance of light; in another there will be no head-ache, or none of which the patient will complain; there will be sleep though it be disturbed and unrefreshing; there will be no peculiar expression of the eye, and no intolerance of light. By one degree of affection the sensibility will be rendered preternaturally intense; by another it will be totally obliterated: one will produce violent delirium, another, only slight

wandering, or unrefreshing slumber: one, violence requiring restraint; another, profound coma. In the circulating system the symptoms will alike vary. One degree will produce a quick, strong and hard pulse; another, a quick, small and feeble pulse; another, a slow and intermittent pulse. A similar diversity will be found in the temperature of the body: in one, the heat will be little changed; in another, it will be below the natural standard; in a third, it will be intense, and the organs of secretion and excretion will equally vary in the extent of their morbid changes.

Thus, from one and the same affection of one and the same organ, not only different but opposite symptoms will be produced in all the organs involved in what we may call the febrile circle. When to this variety are added diversities occasioned by various stages of the diseased processes that are going on in the system; by the previous state of the organs affected; by the re-action of the affected organs one upon another, producing innumerable and ever varying combinations of different intensities of affection, in different sets of organs; and by the treatment to which the whole have been subjected, we cannot wonder if the symptoms of fever appear to be countless.

That no two cases of fever can ever be precisely the same, and that it must be vain to seek for the common phenomena of the disease in the external symptoms, must now be obvious: and why success

can never attend the search after these common phenomena in such symptoms as "shivering, frequent pulse, heat," must be equally manifest. These as well as all other symptoms depend upon the state of the organs. But we have seen that in one degree of the same affection of the same series of organs there may be shivering; excited pulse; burning heat; while in another degree there may be no shivering, a slow pulse and a cold skin: so that from one and the same affection, differing only in the degree of its intensity, the symptoms may not only vary but be directly opposite. The proper object of pursuit in all these inquiries, therefore, is the real nature of the affection, and the symptoms are of consequence only as they are indications of the existence of that affection. Symptoms are not *the* thing in which observation should terminate, but signs of the thing without the knowledge of which, in every individual case that may come under his care, the practitioner ought never to be at rest, and to the discovery of which they serve as guides.

It is then in the organs alone that we can find a perfect uniformity: but their condition is as fixed and invariable as the return of day and night. All the operations of nature are uniform. When, in any case, we have succeeded in discovering what the operation is, we see that it never varies. The same causes, under the same circumstances, always produce the same effects. The causes of fever, what-

ever they be, under the same circumstances, always produce the same conditions of the organs. In proportion as we ascertain with clearness and precision what these conditions are, we observe that they recur in all cases with the most undeviating regularity, and when our knowledge of them shall have become complete, it is probable that we shall find that they are as constant in their return as that of the sun after its setting, and that they no more change in their nature or progress than the sun deviates from its path.

The all important thing for the practitioner to know, then, it can never be too often repeated, is what these conditions are. It is greatly to be regretted that we do not know with precision the condition of the most important organs in the intense fevers of other climates. The condition of the most important organs in the various types of fever as they occur in our own country, we do now know with precision, and the main object of the present work is to give an account of these conditions, and of the signs which denote them.

It is found that particular conditions of particular sets of organs give rise to certain groups of symptoms: these groups of symptoms have been supposed to form different genera and species, and have received specific names. Were the nomenclature of these genera and species of fever perfect, the name would in each case be expressive of the condition of

the organs upon which the assemblage of symptoms it denotes depends, and perhaps in some greatly advanced state of our science, when these conditions have been perfectly ascertained and have become perfectly familiar, an approximation to this desirable classification and naming may be attempted with success. The state of our knowledge, however, enables no one to undertake the task at present, and in the mean time the slightest glance at the divisions which have been attempted of this class of diseases, is but too sufficient to show the total absence of that kind of information, which, if there be any truth in the preceding observations, it is alone of value to possess.

Thus febrile diseases are commonly divided into idiopathic and symptomatic—a division which is liable to the fundamental objection that the diseases included under the second section are not fevers but inflammations. There are no fevers but idiopathic fevers. It has been shown that fever differs from inflammation both in the individual phenomena forming the train that constitutes the disease, and in the order in which the several phenomena succeed each other. There are, it is true, individual phenomena common to both; but since the series as well as the order in which the several phenomena stand in the series are different, to call both by the same name can only produce confusion and misconception.

Of true or idiopathic fevers two great divisions are made; one comprehending intermittent and the other continued fevers: a division founded on the occurrence of the trains of the phenomena in an interrupted or in an uninterrupted series. Intermittent fever is further divided into intermittent and remittent, the interruption in the series being said to be complete in the one and incomplete in the other. In continued fever, on the other hand, the trains of phenomena are supposed to proceed in a perfectly uninterrupted series, whence the name continued. The single fact suggested to the mind of the practitioner by this classification is in the highest degree trivial.

Of the particular groups of symptoms which have been brought together under the great class, continued fever, it is impossible to discover any kind of principle which has led to the formation of the distinct assemblages that have been made, or to their nomenclature when thus collected. Synocha, typhus, synochus, are the three genera which modern nosology, in the power and pride of its strength, has put forth as at once distinctive and exhaustive of this class of disease. The aggregate phenomena constituting synocha, form just that particular series which is common to some forms of fever and to all acute inflammations: namely, "Calor plurimum auctus, pulsus frequens, validus, et durus, urina rubra, sensorii functiones parum turbatæ." The train of symptoms thus brought together do not

alone form any variety of fever. The second group of symptoms forming typhus—"morbus contagiosus, calor parum auctus, pulsus parvus, debilis, plerumque frequens, urina parum mutata, sensorii functiones plurimum turbatæ, vires multum imminutæ:" and the third, forming synochus,—"morbus contagiosus, febris ex synocha et typho composita; initio synocha, progressu, et versus finem, typhus," independently of their being brought together and named according to no known or even assigned principle, are liable to the further and the fatal objection, that they do not even occur in nature.

Even Dr. Wilson Philip, who labours to reconcile to nature and to improve in accuracy and comprehensiveness these classifications and definitions, expressly admits that a simple synocha or typhus is a fever which we rarely, if ever meet with: for that however high the inflammatory symptoms at an early period may be, those of typhus always, at least in this country, sooner or later supervene; and that however well marked the symptoms of typhus may be in the progress of fever, in almost every case, the first symptoms are more or less inflammatory; that the fevers mentioned by authors, under the names synochus and typhus, are in fact no other than varieties of the synochus; that when the symptoms of debility predominate, the fever has been termed typhus; that when, on the contrary, the inflammatory symptoms are most remarkable, and present

through the greater part of the disease, it has been called synocha.*

Again, while according to this received arrangement a train of symptoms, every one of which is found in acute inflammation, is made a distinct genus of fever, numerous diseases, each forming an exquisite specimen of fever, are totally excluded from the order, and placed at a considerable distance in the nosology. Because scarlatina is a fever attended with a peculiar eruption on the skin; because rubeola is a fever attended with an eruption on the skin also peculiar; because variola is a fever attended with another peculiar eruption, and urticaria with another, these diseases are not made varieties of fever, but, designated by the term exanthemata, are formed into a separate order: while, on the other hand, fevers attended with petechiæ, with papulæ, with aphthæ, with vesicles, are accounted fevers, and accordingly are termed petechial, miliary, aphthous, erysipelatous, vesicular fevers; whence synochus petechialis, synochus miliaris, synochus aphthosus, &c.

Without doubt it is right that these varieties of disease should be discriminated and named; but this mode of classifying them has a necessary tendency to divert the mind from dwelling on those essential circumstances which make all of them mere varie-

* Treatise on Fever, &c. By A. P. Wilson Philip, M.D. p. 12.

ties of one great disease; and to fix it upon those comparatively unimportant though obvious circumstances which simply modify the malady without in the least affecting its identity.

It has already been stated that the grouping of the symptoms, or, in other words, the formation of the species of fever cannot be scientifically or usefully accomplished until we have arrived at a perfect knowledge of the condition of the organs upon which the trains depend; and that our knowledge of these conditions is so imperfect, especially with regard to many of the species, that this classification cannot possibly be made at present. It is not even known whether the condition of the organs in intermittent be the same as it is in continued fever. The mere periodicity in the recurrence of the febrile paroxysms by which this class of disease is at present characterised, is an exceedingly unsatisfactory principle of distinction, unless we at the same time knew the state of the system upon which that periodicity depends. The alternate transition of intermittent into remittent and continued, and of continued and remittent into intermittent fever, of which the history of epidemics affords so many striking examples, and of which Sydenham, Pringle, and all the older writers have recorded so many interesting accounts, as events which they themselves daily witnessed, seems to show that there can be nothing amounting to a generic difference between these several diseases.

The type, as far as we have the means of judging, appears to be determined entirely by the intensity of the disease. An intermittent increasing in violence and malignity changes into a remittent or a continued fever, and a continued or remittent, diminishing in violence and malignity, often assumes the form of intermittent. Speaking of the epidemic constitution of the years from 1661 to 1664, Sydenham states that, in the year 1661, the autumnal intermittents which had prevailed for some years broke forth afresh, especially obstinate tertians; that increasing daily until August, at which time they raged fiercely and became extremely mortal, in many places seizing whole families, and destroying great numbers, decreased by degrees until October; and, disappearing at the approach of Winter, were succeeded by a continued fever, which differed from the Autumnal intermittent only in being continued, while the former returned in paroxysms: that both invaded almost alike; that those who violently laboured of either vomited; that in both the skin was dry; the tongue black, the thirst urgent, and that, at their declination, the morbific matter in both was readily exterminated by sweats. "It was manifest," he adds, "that this fever belonged to the family of intermittents, because it rarely appeared in the Spring: it was a sort of compendium of the intermittents; and, on the contrary, every fit of the intermittent seemed to be a compendium of this fever; so that the difference

chiefly consists in this, namely, that the continued fever once begun, perfects its effervescence with the same degree of heat; but the intermittents perform their business by parts, and at several times."*

In like manner, Pringle, among many other examples of the fact, which, indeed, he states to be of constant occurrence, gives an account of an epidemic that prevailed in the army of the Netherlands, and which in its worst form assumed the appearance of an ardent fever. He states that the men were suddenly seized with violent head-ache, and frequently with delirium: that, if sensible, they complained also of grievous pain in the back and loins; intense thirst; burning heat; great sickness and oppression at the stomach, sometimes with vomiting of bile, sometimes with evacuation of bile by stool, accompanied with tenesmus and pains in the back: that this fever generally remitted from the beginning upon bleeding and purging: that if these precautions were omitted, the fever went on in almost a continued form, and that its tendency to putrefaction was so great, that while many had spots and blotches, some had mortifications, which were almost always fatal: that this fever continued to rage throughout August; that it began to abate with the heat in the middle of September; that from this period its violence diminished, and the number attacked gra-

* Sydenham's Works, Chap. 3. p. 11.

dually decreased; and that now "the remissions became more free, so that insensibly, with the coolness of the weather, this raging fever dwindled into a regular intermittent, and entirely ceased upon the approach of Winter."*

What that condition of the system is, which, in forms of fever that are thus mutually convertible, causes one to persist in an uninterrupted series, another to remit, and another, after disappearing for a time, to recur in distinct and regular paroxysms, is wholly unknown. Sydenham, indeed, cuts the knot and removes the difficulty at once. Speaking of the return of the fits in intermittent, he replies to the inquirer into their cause,—"I would fain know why a horse comes to his growth in seven years and a man at twenty-one; or why some plants flower in May and some in June. I am persuaded that the progress of nature is as certain and regular in this case as in any other, and that the matter of a quartan and tertian ague is subject to Nature's laws and governed by them, as well as any other bodies whatever." The regularity of nature in the production of disease, no less than in the maintenance of health, cannot be doubted: but the point in question is not clearly one of those ultimate facts, into the reason of which it is wholly vain for the human mind to inquire.

Hitherto, however, no one appears to have ha-

* Sir John Pringle on the Diseases of the Army, p. 66, &c.

zarded even a conjecture as to the cause of this striking difference between these two forms of disease; and pathology, as has just been observed, has afforded no clear light to enable us to determine whether the febrile circle of organs is similarly affected in both. Examinations of fatal cases have been made; but none on that large scale and with that accuracy which alone can render them of any value. I have endeavoured to ascertain the morbid appearances in the spinal cord and the brain, and in the mucous membrane of the respiratory and digestive apparatus, from those who have been long engaged in extensive practice in districts in which ague prevails: but I have been able to obtain no satisfactory answer, excepting that intermittent does not kill! Greatly as the severity of intermittent is without doubt diminished, in the present age, yet we cannot receive such an account without blessing the bark of the seventeenth and the skill of the nineteenth century.

A similar want of knowledge exists relative to the condition of the organs in most of the Exanthemata. To supply that want in regard to the various forms of fever that prevail in this metropolis, which, there is good reason to believe, differ but little from the types that appear in other parts of the country, is one of the chief objects for which this work is undertaken.

It is not the object of the present volume to treat

of intermittent or of remittent fever, but only of that class which, in ordinary medical language, is termed continued. Of the apparently endless varieties of disease comprehended under the term continued fever, it is found that certain forms occur in this country with great constancy. Each particular assemblage of symptoms occurring in these different forms is said, in ordinary language, to constitute a type or species. Each type or species depends on a particular condition of the circle of organs that has been described. The causes that concur to produce this particular condition of this series of organs, will be treated of in their proper place. But these assemblages of symptoms never occur without being accompanied by these particular conditions of the organs; and these conditions of the organs are never found without having been connected with these assemblages of symptoms. In all the forms of fever hitherto observed this condition of the organs is found to be absolutely the same: it never differs in any thing but intensity; of this the evidence is complete and irresistible: the direct and legitimate inference is, that all these different forms of fever differ in nothing excepting in the intensity of the affection. Were the terms genera, species, variety, merely used as short expressions to denote this fact; to point out and to name different degrees of the same malady, degrees which it is important to discriminate, because they require material modi-

fications of treatment, a clear and precise meaning would be affixed to these words: in nature there would be foundation for the distinction they imply: in practice there might be convenience in their use. But the nosological distinctions at present inseparably associated with these terms, appear to me to be either so vague and unmeaning, or when they cease to be indistinct, to excite notions so false and pernicious, that I think it right to abandon the use of them altogether. The more we investigate the subject, the more satisfied we shall become that continued fever is one disease and only one, however varied, or even opposite, the aspect it may present; but that it differs in intensity in every different case, and that this and this alone is the cause of the different forms it assumes. Many of these diversities it would be frivolous to distinguish: some of them, on the other hand, it is of the highest importance to discriminate. For all useful and practical purposes, it is necessary only to arrange the different assemblages of symptoms into two great classes, the one comprehending the mild and the other the severe forms of the disease. All the forms that continued fever can assume, and all the individual cases that can occur under either, must be mild or severe, and, therefore, must readily find its place under one or other of these divisions. The only real difference in the disease being a difference in degree, it is proper that the principle of the divi-

sion, by which the varieties it presents are classified, should be founded on this, the only true distinction of which it admits.

It is difficult to frame, and still more difficult to bring into use, new terms; and there is nearly equal inconvenience in using old terms in a new sense: but if the new meaning affixed to an old term be clearly intimated and rigidly adhered to, it is, perhaps, upon the whole, productive of less evil to adopt the old, thus determining and limiting the signification, than to propose a nomenclature entirely novel. For this reason, and only for this reason, I propose to adopt two words, borrowed from the nosology of Cullen, and in common use. These words are here employed merely to express differences of degree relative to one and the same disease. The mild degree may be denoted by the term synochus: throughout this work, this term will be used to express the milder form of fever; that is, its ordinary or common form, or that which it is found most frequently to present in this metropolis, and, I may add, in this country. The severer form, on the other hand, may be designated by the term typhus. Each will be found to present a distinct assemblage of symptoms; each will be found to depend upon a particular condition of certain organs; each will be found to require a peculiar treatment.

For the purpose of distinguishing further important differences, that is, differences which bear an

important relation to practice, it will be convenient to divide each of these two great classes into two minor sections. Thus, synochus may be divided into synochus mitior and synochus gravior; and typhus into typhus mitior and typhus gravior. This will afford convenient and ample means of throwing into distinct groups all the varieties of fever that occur in this country, which it can be of any practical importance to distinguish.

This mode of viewing fever as one great and extensive malady never differing in nature, but in every two cases differing in intensity, and giving rise by these differences in intensity to various forms of disease, thus affords a principle of arrangement applicable to all those various forms, which, while it is at once simple and comprehensive, is at the same time in the highest degree practical. It directly leads the mind to the observation of the real, the important differences that exist or that may arise; those differences which must influence and guide the treatment, if it be not altogether blind, and in the worst sense of the term empirical. This principle might easily be extended, and I think with advantage, so as to comprehend the Exanthemata, and all the forms of fever which have hitherto been known to exist, or which can arise. Scarlet fever, for example, is continued fever attended with a peculiar eruption upon the skin: at one time it occurs in a mild, at another in an exceedingly severe form: the assem-

blage of symptoms in the first are precisely those which it is intended to comprehend under the term synochus: the assemblage of symptoms in the second are those which are designated by the term typhus: thus scarlet fever exhibits at one time the synochoid, and at another the typhoid type; the first being what is commonly termed scarlatina benigna, the second scarlatina maligna; and each type is capable of existing in two degrees of severity, one of which may be conveniently distinguished by the term mitior, and the other by that of gravior.

In like manner small-pox is a fever attended with a peculiar eruption upon the skin, which eruption modifies the disease in a very remarkable manner, and gives it a history and progress peculiarly its own; but it is as much a genuine fever as typhus, and ought no more to be taken out of this class on account of the eruption upon the skin, than scarlatina, which likewise modifies, in a very considerable degree, the whole train of febrile symptoms, and is attended with a peculiar condition of some exceedingly important internal organs. Small-pox, like all the diseases of this class, occurs in two widely different forms; the one mild, the other intensely severe: in the first the concourse of symptoms are precisely those of the synochoid, in the second of the typhoid type.* And the same I am

* In scarlatina the affection of the skin modifies the febrile symp-

satisfied is true of the plague, of the yellow fever, and of all the different forms which this great disease, of many aspects and names, but of one uniform and unchanging nature, presents.

These distinctions and names then, though it were easy to raise objections against them, may serve for all useful and practical purposes. They tend to impress upon the mind the great fact that all the modifications of the disease are still only modifications, and do not affect the identity of its nature; and they afford convenient sections under which to detail the symptoms that attend and discriminate the

toms, as has just been said, considerably: in small-pox exceedingly. If, on this account, any one enamoured of nosological distinctions should wish to separate these varieties of disease, it might be done by dividing continued fever into—

1. Continued fever without an irruption;

Synochus mitior,	Typhus mitior,
——— gravior,	——— gravior:

2. Continued fever with an irruption;

Scarlatina,	Variola,
Synochodes,	Synochodes,
Typhodes,	Typhodes:

and so on of all the Exanthemata.

Although the eruption may, and without doubt does give rise to some peculiar symptoms and so modifies the fever, yet the true character of the disease, or *the disease as a subject of medical treatment*, depends entirely on the nature, that is in truth on the intensity of the fever. If, therefore, the Exanthemata can find no place under the genus fever consistently with the principles of nosological arrangement, it appears to me that these artificial distinctions ought to be abandoned: because it is better to reject nosology, than to everlook or to mistake pathology.

important diversities in degree as they present themselves in practice; to exhibit the condition of the organs upon which those diversities depend, and to explain the treatment which experience teaches to be appropriated to these several states.

The present work will be restricted to the consideration of the modifications of fever which we have proposed to designate by the terms synochus, typhus, and scarlatina.

CHAPTER III.

Of Synochus: Division into Synochus Mitior and Gravior. Succession of Phenomena in Synochus Mitior. Indications afforded of Disease in the Nervous, Circulating, and Excreting Systems. Progress of Disease consisting in progressive Increase in the Derangement of these Functions. Phenomena of Recovery. On what the Transition of Synochus Mitior into Synochus Gravior depends. Classification according to the different Organs in which the several Affections have their Seat. Hence Synochus Gravior with Cerebral Affection—Subacute—Acute: with Thoracic Affection: with Abdominal Affection: with Mixed Affection.

It has been stated that, for the purpose of forming into distinct groups certain assemblages of symptoms which it is important to distinguish, because they bear an important relation to practice, it will be convenient to divide the synochus, the term by which we propose to designate the common fever of this country, as it presents itself in its mild aspect, into two sections, namely, synochus mitior and synochus

gravior. For reasons already assigned, it will likewise be important, in treating of these different modifications of fever, to notice in each both the phenomena which form the assemblage, and the order in which they succeed each other.

On careful examination it will be found that the first symptom which denotes the commencement of the ordinary fever of this country, in its mildest form (synochus mitior,) is a loss of mental energy. This is by no means the first symptom which attracts attention: it is commonly overlooked for some time, and excites little notice until it has become distressing. Patients in general are incapable of analyzing their sensations or of determining the order of their succession; but if medical men, who are but too subject to be attacked with this disease, will take the trouble to reflect on the order of events as they occurred to themselves, they will probably be satisfied, after the most attentive consideration, that the first indication of disease they felt was a want of power to conduct their ordinary mental operations with ease and vigour. Such at least, perhaps I may be permitted to mention, was the fact in my own case; for, having suffered a severe attack of fever, I have a distinct and vivid recollection of the dulness, confusion, and want of mental energy which I experienced for a considerable time before I was conscious of any corporeal debility.

This affection of the mind consists particularly in

indistinctness and consequent confusion in the trains of ideas; in inability to attend to their relations; and, as a necessary result, in the loss of power to think clearly. The individual feels that he is not in a state to form a sound judgment on any subject upon which he may be called to decide.

Closely connected with this mental weakness is the loss of energy in the muscles of voluntary motion. Lassitude is the result. The patient cannot move with his usual vigour, nor even sit without the feeling of weariness. The debility thus seizing upon both body and mind, sometimes occurs in each so nearly simultaneously that, it must be owned, it is difficult to determine in which it appears first.

The next symptom in the order of succession is still more characteristic: it consists in an uneasy sensation which is quite peculiar to this state of the system. No description can convey any idea of it to one who has not felt it; and to him who has felt it the word fever recalls this uneasy feeling so instantaneously and vividly that I apprehend most unprofessional persons conceive it is this very feeling that constitutes the essence of the disease. It is much more distressing than pain: the mere restlessness which accompanies and which forms so large a part of it, any one would gladly exchange for intense pain. In all diseases it is this which makes the sufferer on his midnight pillow exclaim, "oh! that it were morning!" and in the day, "would that it

were night!" Though it is so frequent in its occurrence, and so peculiar in its nature, yet I am not aware that it has received any distinct name: it may be called, until a better is suggested, febrile uneasiness.

It is seldom that these symptoms exist long before positive pain is felt. With very few exceptions pain is first felt in the back or loins and then in the limbs. It is rare that this symptom is absent in the commencement of this form of fever, and it often occasions more uneasiness to the patient than any thing else during the first stage of the disease.

Already a remarkable change is commonly visible in the countenance. Its expression is that of dejection: it is often strikingly similar to that of a very weak person suffering from fatigue. The colour of the face is pallid, and the features are somewhat shrunk; but its general aspect is so peculiar and characteristic that an experienced eye can distinguish the disease even at this early period, and without asking a single question.

The skin partakes in a remarkable degree of the debility which so early shows itself in the muscles of loco-motion. This is indicated in a striking manner by its increased sensitiveness to the physical agents by which it is surrounded, and by its inability to resist their influence. Ordinary degrees of temperature produce a sensation of cold which is sometimes intolerable: chilliness is felt even in a

heated room, or in a warm bed: hence the sensation of cold, sometimes increasing to shivering, which has been considered one of the most constant signs of fever. But this feeling of chilliness by no means depends on external temperature: it is increased by cold, but it exists in spite of an elevated temperature: it arises from an internal cause, and is not to be counteracted by external heat.

While the patient experiences the sensation of cold, there is no diminution of the quantity of caloric in the system. The thermometer applied to any part of the body commonly rises as high as in the state of health, and the skin, touched by the hand of another person, communicates not the feeling of cold, but often, on the contrary, that of preternatural heat. There is no positive abstraction of caloric from the body nor any failure in the process, whatever it be, by which animal heat is generated; there is only altered sensation, in consequence of derangement in the function of the skin. In this form of fever, the chilliness in many cases never amounts to shivering; in others, there is an attack of well-marked rigour, and in others, again, there is either no feeling of cold, or it is so slight that it escapes observation.

The symptoms now enumerated are all clearly referrible to derangement of the function of the spinal cord and brain. There is as yet no affection of any

other organ obviously or, at least, much developed. The circulating system, it is true, is just beginning to be affected. The pulse is no longer perfectly natural. It is more languid than in the state of health; sometimes it is also quicker: at other times it is slower; now and then it is scarcely changed in frequency, but its action is invariably weaker than in its sound state.

At the same time the respiration is affected in a corresponding degree: it is shorter and quicker than natural; the chest does not expand so freely, and compensation seems to be sought in an additional number of respirations. Oftentimes neither the pulse nor the respiration appears to be much altered, if the patient remain perfectly still; but if he rise and walk across the room, the pulse instantly becomes rapid, and the respiration is quickened almost to panting.

The transition from the affection of the nervous and sensorial to that of the circulating and the respiratory systems is thus clear and striking. Physiology teaches us how closely these systems are connected, and how mutually they are dependent one upon the other, the closest observers and the ablest experimentalists candidly confessing that they are scarcely able to determine which is the least dependent, or the action of which is the least necessary to the other's performance of its functions. The nervous system being first deranged, it is thus consonant

to what we know of the healthy function of the animal economy, that the circulating and the respiratory systems should be the next to suffer.

How long the nervous system may continue thus deranged, before any other organs are involved, excepting the circulating and the respiratory, to the extent just stated, is uncertain. There can be no doubt that in this mild form of fever, the range of the duration of this isolated state of disorder, if we may so express it, is from a few hours to several days. The rapidity or the slowness with which other systems of organs become involved seems to depend very much upon the acuteness of the attack. In general, the more acute the fever, the more rapidly the individual phenomena succeed each other, and the entire series becomes complete. But this is not, and it is important to bear in mind that it is not invariably the case: for experience teaches us that the severity and danger of the disease are not diminished by the slowness of its approach; and that cases occur, which are slow in forming, and which do not for awhile excite alarm, that ultimately become truly formidable.

It has been stated that the circulation languishes with the diminished energy in the sensorial faculties, and the loss of power in the muscles of locomotion. After awhile, the pulse which was feebler than natural becomes more full, more strong, and generally more quick than in a sound state; and now the skin, which

was cold, becomes preternaturally hot. The previous cold consisted, for the most part, of altered sensation, there being little or no loss of caloric: but the feeling of heat, on the contrary, is the result of an actual increase of temperature; for the heat in the interior of the body, as well as on the surface, rises in some cases several degrees, as is ascertained by the thermometer; the range of increase being from the natural standard 98° to 105°, beyond which it is seldom found to augment in this form of fever. The heat is at first not uniform over the entire surface of the body: it often happens that some parts are cold while others are burning hot. The heat is oftentimes particularly intense over the forehead, or over the back part of the head, or over the whole scalp, while the cheeks are commonly flushed. All these symptoms denote a morbid condition in the action of the heart and arteries. Since the generation of animal heat is so intimately connected with the circulating and the respiratory functions, it is probable that the increase of temperature is the result of some morbid action of the capillary vessels belonging to these systems. What the disordered action of these vessels is, which produces increase of temperature, we do not know, because we do not know what their natural action is which produces the temperature of health: but the object of scientific observation is in some degree accomplished, when it is ascertained that one condition of these

functions is invariably connected with a morbidly-diminished temperature; another with a morbidly-augmented temperature; and another with the temperature of health.

Immediately the circulation is thus excited, the functions of secretion and excretion become deranged. The mouth is now dry and parched; the tongue begins to be covered with fur; thirst comes on; the secretion of the liver, probably also of the pancreas, and certainly of the mucous membrane lining the whole alimentary canal, is vitiated, as is proved by the unnatural quantity, colour, and fetor of the evacuations; the urine likewise is altered in appearance, and the skin is not more remarkable for the sense of heat, than for that of dryness and harshness which it communicates to the touch. With the excitement of the pulse and the increase of the heat, the pain in the back and limbs and the general febrile uneasiness are much augmented.

At this period, then, the fever is fully formed; the series of morbid phenomena is complete: any thing more that happens is referrible to degree and to duration, and must be the result of one or other of these circumstances, or of their combined operation. And we now see that the organs affected, constitute precisely that system of organs which has been described as forming the febrile circle: that the symptoms which denote the fever are just the symp-

toms which indicate a derangement in the several functions performed by these organs; and that the order in which they become successively involved is exactly that which has been assigned.

As soon as the preternatural heat comes on, pain begins to be felt in the head. Dr. Clutterbuck, in describing the general character of the ordinary fever of London states* that "the *first* symptom almost invariably complained of is more or less of uneasiness of the head." If by uneasiness be meant pain, there is, if there be any truth in the preceding observations, a long train of symptoms to intervene before this symptom occurs. That it does ultimately occur is certain: but commonly its place in the series is much later than is here assigned: it is disordered function of the brain, indicated by loss of mental energy, that appears to form the first symptom in this morbid train.

The pain, when it does come, is sometimes slight at first, and occasionally it remains slight throughout the disease; at other times it is pretty severe. Cases sometimes occur, in which, instead of pain, there is only a sense of giddiness, and now and then the uneasy feeling is described as that of lightness: or, on the contrary, as that of heaviness or weight. But whether the feeling be pain, and that pain be slight

* Observations on the Prevention and Treatment of Epidemic Fever, by Henry Clutterbuck, M.D. p. 15.

or severe, or whether it be giddiness, or lightness, or heaviness, it indicates a similar condition of the organ, and requires a similar treatment.

With the accession of pain of the head there is a manifest increase in the disturbance of the sensorial functions. The inability to think, to compare, to reason, to judge, great as it was at the commencement, is now much greater. Instead of being more dull, there are certain states of the mind which now become more acute and vigilant even than in health. Sensation itself, at this period, is invariably acuter than natural, as is indicated in all the organs of sense. The eye cannot well bear the light: there are few cases in which the full glare of day does not excite uneasiness, while in many the ordinary light of a room cannot be borne: in these cases the opening between the eye-lids is frequently observed to be contracted, as if from an involuntary effort to exclude a portion of that stimulus which in health excites no inconvenience, and this state of the eye-lids assists in giving to the eye its dull and heavy expression, so characteristic of fever. The increase of sensibility in the organ of hearing is equally striking. Sounds which were not noticed during health become acutely and even distressingly sensible, while accustomed noises, such as that of a crowded street, are always painful and often intolerable. The skin, considered as an organ of touch, is in a like morbid state. An impression barely sufficient in the state

of health to produce sensation excites the feeling of tenderness, and alterations of temperature, which in ordinary states are scarcely perceptible, are painful. The senses of taste and smell, on the contrary, are nearly obliterated, owing to the altered condition of the membranes upon which the sensitive nerves are distributed.

From the earliest attack of the disease the sleep is disturbed and unrefreshing; now scarcely any is obtained; the febrile uneasiness will not allow of repose; the patient cannot remain in any position long, incessantly shifting his place, never eluding his pain. At this stage the sense of uneasiness in the limbs, oftentimes the severity of the pain over the whole body, is peculiarly distressing.

With this progressive increase in the affection of the spinal cord and the brain, the derangement in the circulating system is proportionally augmented. The pulse is invariably altered, both in frequency and character. Generally it rises to 90, sometimes to 100; but in this form of fever it seldom exceeds this number; and occasionally it never rises above 80. The stroke of the pulse is usually stronger and fuller than natural, though it commonly retains its softness, and does not impress the finger with that sensation of sharpness which is characteristic of ordinary inflammation. Occasionally, however, a degree of sharpness may be perceived in it, and it is not easily compressed.

The thin white fur which already had begun to appear on the tongue progressively increases in extent and thickness. The colour of the fur usually changes, as the disease advances, from a dirty-white to an ash-colour; but in this form of the disease the tongue always remains moist, and never becomes brown. This state of the tongue is almost always accompanied with thirst, but it is never urgent. There is always a loss of appetite. The bowels are generally constipated, and the secretions of the whole alimentary canal are vitiated.

Thus we perceive that the progress of the disease consists in increasing mental and corporeal weakness; increasing pain in the back, loins, and limbs; increasing heat of skin, acceleration of pulse, and general febrile uneasiness, together with the occurrence of pain in the head, and progressive derangement in the functions of secretion and excretion.

The fever in this mild form is now at its height. It remains stationary, or at least with very little change for an indefinite period, generally for some days. The cerebral affection does not increase beyond what has been described: there are no greater indications of disease in the respiratory organs, and the mucous membrane of the stomach and intestines does not denote any progressive advancement in disease.

One of the most remarkable circumstances connected with the ordinary fever of this country, in the

present day, is the uninterrupted and perfect continuity of its phenomena. As long as the febrile state remains, nothing deserving the name of a remission is in general to be perceived. Occasionally, it is true, a slight increase in the symptoms may be observed towards evening, especially in the heat of the skin; but even this is not common, and it is scarcely ever great enough to deserve the distinction of being called an exacerbation. Much less is there any regularity in the accession and decline of such excitement. In the great majority of cases not the slightest approach to an exacerbation and a remission can be distinguished from the commencement to the termination of the disease. Yet the older writers speak of these events as if they were as palpable as the paroxysms of intermittent and as constant as the return of morning and evening. There cannot therefore be a doubt that the character of the ordinary fever of this metropolis is greatly changed from the character of that which prevailed two centuries ago; and the circumstances which have contributed to produce this change will be considered hereafter.

In the great majority of patients in whom the symptoms continue thus moderate, the disease disappears about the end of the second week; that is, they are convalescent at that period; but it usually requires eight or ten days longer before they have regained sufficient strength to leave the hospital.

Sometimes, although there is no greater severity in the symptoms, the disease is more protracted, and the recovery is not complete until the fourth or even the fifth week. Beyond this period it is very rare for this form of the disease to be protracted.

Almost all who are attacked with the malady in this, its mildest form, recover: but now and then it happens that the symptoms go on with this degree of moderation until about the end of the second week. Then at the period when it is usual for convalescence to take place there is no perceptible improvement; the patients seem even to grow weaker; they lie more prostrate in the bed, and they are soon incapable of moving; still they complain of no pain or uneasiness, and it is not easy to detect any trace of disease in any organ; yet it is but too evident that they grow worse, and ultimately they sink exhausted. In these cases, on examination after death, it is commonly found that disease has been preying on some vital organs, although its presence could not be detected during life; and this termination of the milder type of fever rarely happens, excepting in aged persons, whose constitutions have been enfeebled by previous diseases, or worn out by the various causes which depress and exhaust the powers of life.

With an occasional exception of this kind the disease in this form always terminates favourably; and the first indication of returning health is remarkably uniform: it is almost always marked by longer

and more tranquil sleep. Instead of that restlessness which is so characteristic of fever, and which forms the most distressing part of it, the patient is observed to lie more still, and on waking for the first time from an undisturbed slumber, he often spontaneously says that he feels better. Better he may well feel, for his febrile uneasiness is gone; the load that oppressed him is shaken off; he is a new being. The pain of the head and of the limbs is so much diminished that often he cannot help expressing his thankfulness at the change. The countenance becomes more animated; its natural expression returns; the tongue begins to clean; and after this state of the system has continued for two or three days, the appetite returns. While these favourable changes are going on, the pulse usually sinks about ten beats below its highest point at the height of the fever; it is not uncommon, however, for it to remain quick during the entire period of convalescence; and for some considerable time it is easily excited on any movement of the body, or any emotion of mind. In some cases, on the contrary, when the attack has been very mild, it sinks considerably below the natural standard, and is intermittent, a sign which I have uniformly observed to be attended with a sure and steady convalescence. In the mean time the appetite becomes keener than natural; the strength gradually improves; and in a short time the patient is restored to his usual health and vigour.

What the condition of the brain and of the organs correlatively affected is, in these the mildest cases, we do not positively know, because we have no opportunity of inspecting them, their favourable termination being nearly without exception. But the more all the phenomena are considered in their entire series, in the order of their succession, in the uniformity, nay, even in the exclusiveness of their seat, as well as in the unchanging sameness of their effects, the more clear the evidence will appear of the soundness of the induction, that the condition of all the organs in all the types of fever is the same in nature, although there be no two cases of any type perfectly the same either in the degree of the affection or in the stage of the morbid process which it excites. If this induction be really just, we must conceive that, in the synochus mitior, while the morbid affection of the organs is slight, the diseased process which it sets up in them stops before it produces any change in their structure.

However this may be, and to leave for the present all matter of inference, and to keep strictly to the matter of fact, we do positively know that the mild forms of fever become severe in consequence of the supervention of inflammation in certain organs. Perfectly unknown as the nature of the primitive febrile affection at present is, yet that in the progress of the disease it does ultimately pass into inflammation is a fact, the evidence of which it is impossible to

resist; although the same observation which teaches us this most important truth, teaches us also that the inflammatory action is always considerably modified by the febrile state. How it is so modified, and to what extent, we shall consider hereafter. I have spent much consideration and some labour in the effort to combine the symptoms which attend these severer forms of the disease with the ascertained conditions of the organs upon which such symptoms depend. But since it is of paramount importance that the events which actually take place should be known, and that the order in which they succeed each other should be stated with clearness and exactness; and since I have been able by no method that I could think of to combine the pathology with the history without breaking too much the continuity of the latter, I have been under the necessity of separating these two most intimately connected subjects, and of treating of them under distinct sections. In giving the history of the events, I have detailed them strictly, as far as I am acquainted with them, in the order in which they occur: and I have endeavoured to arrange the cases that constitute the pathology in such a manner, that they shall closely correspond to these events, and clearly illustrate the order of their succession. If I have succeeded according to my wish, the reader in studying the cases will be reminded, as he proceeds, of the successive stages of the history, and if he again revert to the history, after having

studied the pathology, he will be reminded of the morbid appearances in the organs which are there described. To afford a clear perception of the connexion between the successive events, as indicated by the symptoms during life, and the progressive changes of structure in various organs, as demonstrated by inspection after death; and thus to establish a strong and indissoluble association in the mind between the morbid condition and its sign, are the objects at which I have aimed. If I have succeeded, I shall have accomplished one of the chief objects of my undertaking.

The transition of a mild case of fever into a severe one, or the progress of a case severe from the commencement, is accompanied with, or depends upon, as will abundantly appear hereafter, certain changes that take place in certain organs. These changes occur with great regularity; the organs in which they take place are always the same; and the symptoms by which they are denoted are uniform. The organs affected are the spinal cord, the brain, the membranes of both, the mucous membrane of the lungs, and the mucous membrane of the intestines. For the reason just assigned the nature of these affections cannot be described in this place, but must be postponed to that part of the work which treats of the pathology. Since however the symptoms are nothing but the signs of these conditions, and the history of the succession of the former, is

nothing but an account of the indications of the successive changes that take place in the latter, all the important symptoms must necessarily have their seat in the head, in the thorax, and in the abdomen. Mixed and blended as they appear in the different cases which the practitioner is called upon to treat, nothing can appear more complex or more variable: when analyzed, nothing is more remarkable than their simplicity and their uniformity. In order to perform that analysis with exactness, and to render it really instructive, these symptoms must be contemplated as they arise in the affected organs. These organs, as we have seen, are the cerebral, the thoracic, and the abdominal; the symptoms therefore divide themselves into cerebral, thoracic, and abdominal: there is, indeed, a fourth order, in which all the organs appear to be equally involved; in which the general affection is intense, and which therefore may be appropriately termed mixed. We shall see that cases of this kind constitute by far the most dangerous form of the disease.

I. Synochus Gravior with Cerebral Affection, occurs under two degrees of intensity: when the cerebral affection is moderate, it may be termed subacute; when great, acute.

1. *Synochus with Subacute Cerebral Affection*, may be attended for several days with no symptom which has not been already enumerated in the ac-

count of the mildest form of the disease. The accession is the same as in synochus mitior: the progress up to a certain period is also the same. But at the time when the pain of the head diminishes in the latter, it increases in the former. Still the pain is often not severe. He who looks for intense pain, and suspects no cerebral affection, unless accompanied with this symptom, will be surprised by what will appear to him the sudden occurrence of new symptoms, such as are immediately to be stated, which will at length open his eyes to the danger of the case, and excite his wonder, which it is not unfrequent to hear expressed, that an affection hitherto so mild, should, without any previous warning, become so formidable, and show but too manifestly that it is beyond control, and will certainly proceed to a fatal termination. The warning was given, but the sign was not understood. The descriptions of disease are commonly taken from its most acute form; and it was long the practice to derive them from this form alone, and the consequences were truly fatal. Even with the best care that can be taken in drawing up the history, these descriptions are exceedingly apt to become ideal, and not real entities: to consist of a collection of all the circumstances that exist in all cases, and not of that particular combination only which is found in any one case: and thus to be not the portrait of any individual, but a fancy picture bearing a general resem-

blance to all individuals without being the true likeness of any. The consequence is, that at the bed-side of the sick the original from which the picture is supposed to be taken is not to be seen, and the practitioner remains in doubt, if he do not fall into error. Error serious and fatal many have fallen into, and, on this very account, still continue to fall into, with regard to the existence of cerebral disease in fever. Abundant evidence will be given in the pathology, that it is not uncommon for the most unequivocal and extensive changes of structure to take place in the brain and its membranes without severe pain having ever been felt. Pain, however, though it be not great, is almost always present. It is seldom that the pain extends over the whole head; the patient generally points to some particular part where it is peculiarly felt. In the majority of cases the seat of the pain is either in the forehead, or at the temples, or over the eyes; but occasionally it is in the occiput, and extends down the neck, and in these instances it is often severe between the shoulders.

Now and then no pain whatever is felt. Question the patient as much as you please, and he will tell you that he never has felt any pain. In this case giddiness is the substitute. Giddiness in the commencement, and in the early state of fever, is as certain a sign of cerebral affection as pain. Striking illustrations of this are afforded by several cases detailed in

the pathology; by consulting which, the reader will see that precisely the same morbid changes take place in the structure of the brain, although nothing but giddiness be complained of, as occur in those which are attended with the acutest pain. The practitioner will therefore fall into a fatal error who is seduced into security because pain is absent; and who neglects the remedies proper for inflammation of the brain, because the patient complains only of giddiness. If giddiness be combined with pain, or alternate with it, which is not uncommon, the giddiness being slight if the pain be severe, and the pain being slight if the giddiness be distressing, it indicates a more severe affection than if either exist alone.

2. In the majority of cases, as long as the pain continues, the heat of the skin remains considerably above the natural standard. But often the heat over the general surface of the body is not great. Commonly, however, it is hotter than natural over the head, and it is hottest wherever the seat of the pain be fixed: so that the contrast is often striking between the temperature over the forehead or at the occiput, and the heat of the body in general.

3. The dull and heavy expression of the eye is greater than in the milder form of fever. The conjunctiva generally becomes brighter and more glistening than natural: though instead of this the vessels are often more numerous and more turgid than usual, and give it the appearance which is termed

"muddled." The eye at the same time is commonly preternaturally sensible, and cannot bear a strong light, although sometimes no complaint is made if the curtains of the bed be withdrawn, or the window-blind be drawn up.

4. There is usually a corresponding increase in the general sensibility; and what is remarkable, this is quite as much indicated by the increased sensibility to sound as to light. A loud noise is invariably distressing to the patient, and a continuance of it greatly aggravates all the symptoms. Exposure to a glare of light and a loud noise, would alone rapidly change a slight into the severest cerebral affection.

The expression of the countenance is now very peculiar: it cannot be described, but the experienced eye can seldom fail to recognize it. It is indicative of suffering without the strength to bear it: it is not anxious; that expression does not come on until a later period. The face is sometimes flushed, but it is often pallid, which does but add to the peculiar character of its expression.

5. As long as the pain of the head, the giddiness, and the increased sensibility continue, there is invariably a want of sleep. The degree of sleeplessness is not always in proportion to the head-ache or to the other symptoms; but while the latter are present, the former is never absent. That condition of the brain upon which sleep depends appears to be

easily disturbed by a great variety of causes; but whatever be capable of affrighting this heavenly visitant, "tired Nature's sweet restorer," whether in the mansion, the palace, or the prison, and whether from the bed of healthful slumber or from the couch of sickness, nothing so effectually and so constantly banishes it as that febrile uneasiness of which we have already spoken; and which, instead of declining, as in the milder form of fever, now increases in strength and activity, and will scarcely allow the restless body to remain in one position for a moment. He who has felt its influence in this stage and degree of fever, will admit that there is nothing comparable to the wretchedness it produces, except it be the sweetness of the first waking moment after the first tranquil slumber of returning health.

6. And now, sometimes closing this train of symptoms, but more frequently being the first harbinger of another, delirium appears. Delirium is usually first observed when any slight sound rouses the patient from that disturbed slumber which is the only substitute allowed for sleep. The delirium is seldom violent or long-continued, but, when present, is like the talking of a person during sleep in a disturbed dream. This symptom, however, is by no means invariably present, and when it does come, it often postpones its visit to a somewhat later period.

7. The pulse, during all this time, may not be much quicker than in the mild form; and the state

of the tongue and of the evacuations does not materially differ.

Such is the train of symptoms when the brain becomes prominently affected. These symptoms continue without intermission, and with little change, for several days. The period of their duration, when only in this degree of violence, is commonly from eight to ten days: when their character is still milder or more subacute, or when they have been mitigated by appropriate remedies, it may be protracted fifteen days.

About this period a remarkable change takes place; an entirely new train of symptoms supervenes, which is different, and which, indeed, presents a striking contrast, according as the patient is destined for life or death.

If it be for life, that sleep, of the long absence of which we have already spoken, returns; and nothing can more truly express its character than its familiar name, "balmy;" and healing is its influence. From two or three hours of such slumber, the patient awakens a new being. Not that the change is at first striking to an inexperienced eye; but there is no fever nurse who does not recognize it in a moment, and it is not long before the patient tells you that he feels it. The febrile uneasiness is now much diminished: the head-ache is greatly relieved; and the skin is cooler and softer. The pulse may not yet be altered, or it may be a few beats slower than before,

but there is almost always already an improved appearance in the tongue, which shows a beginning disposition to clean. These favourable changes gradually increase. If the sleep the next night be longer and more refreshing, which it generally is, on the following morning a decided improvement is visible in the countenance. The eye is clearer and more lively, and the expression of the countenance is more natural. The skin continues cooler and softer; the tongue is still cleaner, and the pulse, perhaps, slower by a beat or two; and from this period, if no untoward event happen, the convalescence proceeds just as has been described in the return of health in the milder form of fever.

If, on the contrary, the case proceed unfavourably, a totally new train of symptoms at this period sets in.

1. In the first place, the pain of the head obviously, and sometimes strikingly, diminishes. Often it disappears altogether, or, if any uneasiness remain, it is rather a sense of dulness and heaviness than pain. In like manner the giddiness, if that were urgent, is no longer perceptible: but it is remarkable that the pain in the back and loins not unfrequently continues for some time after the headache has disappeared: but, ultimately, that also ceases. The period at which this important change takes place depends upon the severity of the attack, and is materially influenced by the activity or inertness of the treatment. In the subacute form, it

usually takes place about the tenth day from the commencement of the disease.

2. Simultaneously with the disappearance of the head-ache, there is a remarkable diminution of the sensibility. The mind is duller and more heavy. The patient may still be roused to answer with tolerable coherence if spoken to; but when left to himself he is confused and stupid. The eyes now become injected: often suffused; and the heaviness and dulness of their expression is increased.

3. It is at this time that delirium, if it appear at all, most commonly comes on. The increasing insensibility, if not attended with decided delirium, is almost always accompanied with moaning or incoherent muttering, especially during the short and interrupted slumbers which form the substitute for sleep.

4. Striking as these changes are in the functions of the spinal cord and brain, those which take place in the number and character of the pulse are no less important. Even in cases the most decidedly subacute, it is seldom that it does not rise ten beats, so that if before it were 90, it will now be 100, and it is always weaker.

5. Now, too, signs of disease in the chest and abdomen are almost always to be distinguished. A case purely cerebral, from the commencement to the termination of the disease, is rarely to be met with. If there be not cough, there is almost always a short

and hurried respiration, and more or fewer of the indications of abdominal affection hereafter to be stated. Even in cases the most purely cerebral the tongue always becomes more loaded and often dry; and it is strikingly characteristic of the state of the nervous system, that while the tongue becomes dry, the thirst diminishes.

Thus far it is possible that the disease may proceed towards a fatal termination without proving mortal. It is not often that its course is turned back or stayed after it has made this progress; but still such an event is sometimes witnessed. When it does occur, the amendment, both in its origin and progress, is very similar to that of the favourable change which has already been described. More tranquil and longer-continued sleep is almost always the earliest sign that, in this severe struggle, life has obtained the victory. If, on awaking from such sleep, there be less delirium, were delirium present, or greater tranquillity, were the restlessness urgent; and if there be *any* increase, although slight, in the sensibility, or any improvement in the expression of the countenance, hope may be entertained that that victory will be won; and hope may become assurance, if the tongue which had been loaded become clean at the edges, or the dry tongue become moist. Even under apparently the most desperate circumstances, if these three symptoms concur, a favourable prognosis may be pronounced

with tolerable certainty. Two or three days *may* elapse after their occurrence, before any remarkable change is observable in the pulse; but it is seldom that they continue twenty-four hours before the pulse falls at least ten beats. Now and then, on leaving a patient in the evening with a pulse at 120, we are surprised and delighted to find it in the morning as low as 100. When the pulse has thus fallen towards the natural standard, when the tongue has begun to clean, and when the skin has become cool and soft, however desperate his condition but a few days before, the patient may be said to be convalescent.

But though this favourable change is sometimes witnessed, yet, from the point at which we left off the description of the progress to a fatal termination, the too common history is, increasing restlessness and sleeplessness; insensibility lapsing into coma; further acceleration of the pulse; greater dryness of the tongue and decreasing strength, until, at length, the powers of life receiving less and less supply from the great systems in which they have their seat, become completely exhausted.

Those who have been placed in situations which have afforded them opportunities of witnessing much of the disease will, I trust, acknowledge that the account now given is an accurate narrative of the symptoms that occur, and of the order in which they succeed, in the great majority of cases. Upon

what conditions of what organs they depend will be illustrated in the pathology.

Sometimes to these, other trains of symptoms are added—namely, muscular tremor, frequent and sudden screaming; rolling of the head upon the pillow; constant tossing of the hands about; picking at the bed-clothes or other surrounding objects; partial paralysis of the upper eyelid, so that one or both of the eyes remain half or almost wholly closed; the ball of the eye unsteady or constantly rolling; the expression of the eye and countenance at one time wild and anxious, at another fatuous; squinting; the respiration now slow and laborious, now exceedingly rapid; the pulse either slow, full and regular, or slow and intermittent, or so quick that it cannot be counted, or these states succeeding each other or alternating with each other at short intervals; convulsions; involuntary and unconscious stools—all these symptoms are never found combined in any one case; but certain assemblages of them occur with some degree of constancy, and depend upon certain conditions of the brain and spinal cord. Since, however, the description of these conditions cannot be given here, the further account of the signs which denote them must be postponed until we treat of the pathology of the disease.

2. *Synochus Gravior with Acute Cerebral Affection.*—Such is the history of the synochus gravior

with cerebral affection in its subacute form. When its attack is the most acute, the history is precisely the same, excepting that the symptoms are more severe, and their progress quicker. The head-ache is much more intense; the giddiness is more violent; the sensibility is excessive; the least noise is intolerable; the slightest motion either of the head or of the body aggravates all the symptoms; the eye is muddy, and very soon becomes injected, and is perfectly intolerant of light; the pain in the back, loins, and limbs, is nearly as great as it is in the head. The skin is intensely hot, and sometimes impresses the hand with the sense of pungency; but though every where thus hot and dry, its temperature is peculiarly great over the scalp, so that if the head be shaved, and wet cloths applied, they are quite dry in a minute or two. The febrile uneasiness is excessive; the patient can scarcely remain a moment in the same posture, and he is wholly without sleep. The pulse at one time is strong, full, bounding, and not easily compressed, but even in this acute form it is almost always soft; at least it is very different from the hardness characteristic of an acute attack of pure phrenitis; at another time it is oppressed, the stroke giving an impression directly opposite to that produced by the free and bounding pulse.

But one of the most remarkable modifications of the pulse, one that is characteristic of an exceedingly acute attack of cerebral disease, and one with

the import of which it is of the highest consequence to the life of the patient that the practitioner should be perfectly acquainted the moment he meets with it, is the slow and intermitting pulse. Whenever, in the onset of fever, a patient is found with intense head-ache or intense pain in the back and loins, and *a slow pulse*, the physician ought to be greatly alarmed at the severity of the symptoms that are to follow, and if he do not take the most active measures to break the violence of the disease at this early period, it will be beyond all control in a day or two, and the patient will be dead before the fever is well formed in milder cases. The affection of the brain is sometimes so violent and sudden that the pulse is not only slow, but intermitting, and the respiration is suspirious. Frequent and deep sighing is not uncommon in severe cerebral cases, and it is highly characteristic of intense cerebral affection; but in such a violent attack as that of which we are now speaking, the suspirious breathing, even in the very commencement of the disease, is so great that it cannot be overlooked. This happened in the case of my friend Dr. Dill, whom I saw a few hours after the commencement of an attack of one of these intense forms of fever. I saw him in the afternoon at a public meeting. I met him an hour afterwards at his own apartments. He was still going about engaged in his ordinary occupations; but his countenance was pale as death; his eye was dull and

heavy; his mind was confused, and as it seemed to him paralysed; he had other sensations, which were new to him, and which were most distressing; *but he had no pain:* at that time there was not the slightest pain either in his head or his back or loins: there was only that general and undefined uneasiness which gave to him sufficient warning of what was coming, as the slow and labouring pulse, coupled with the uneasy sensations of which he complained, and the peculiar aspect of his countenance, afforded to me an abundant confirmation that his apprehensions were just. He was bled immediately to the extent of twenty ounces: the blood then drawn was not sizy: he passed a wretched night. I saw him early the following morning: he had now intense headache; his eye was already injected; his skin was not hot but burning; his respiration was suspirious; almost every breath was a sigh, and his pulse was *still slower* than on the preceding evening, and was now *intermittent:* blood being drawn to a large extent, the crassamentum was now buffed and cupped; but the detail of the progress of this instructive case must be postponed until we speak of the treatment of fever, because it is still more illustrative of the effects produced by the vigorous application of the appropriate remedies than of the peculiarity of the symptoms which usher in the attack. It may suffice for the present to observe that this case affords not only a striking example of the concurrence of these peculiar

symptoms, but also a decisive proof that pain of the head is far from being the *first* symptom that occurs even in the most intense cerebral attack.

In these acute forms of the disease, if the proper remedies be not vigorously employed, the pain ceases *within the fourth day;* it rarely extends beyond the fifth; the pain passes into insensibility; delirium comes on, sometimes so violent as to require restraint, but delirium is by no means an invariably concomitant of the other symptoms, even when these are the most violent: when it is present it is almost always rapidly followed by muscular tremors, and these by subsultus tendinum, which now and then usher in general convulsions; but this last event is rare, and I have never yet seen convulsions unaccompanied with a particular condition of the brain hereafter to be described. Sometimes the muscular tremors succeed immediately to the transition of the pain into insensibility, while the insensibility rapidly increases to stupor, and that to profound coma. The breathing is occasionally as stertorous as it is in apoplexy, but this is also rare, and when it does occur, is probably dependent on a peculiar condition of the brain hereafter to be pointed out. Together with these there is a concurrence of a greater or a lesser number of the symptoms enumerated at page 119, but the particular combinations that are found most usually to accompany particular conditions of

the brain, it will be most instructive to state in connexion with the pathology.

In synochus with acute cerebral disease there is less indication of thoracic and abdominal affection than in the subacute form, because the intensity of the cerebral disease obscures the signs of derangement in the other organs; but the signs of their derangement are never absent, although they are less obtrusive, and they trace in indelible characters proofs of their activity in the ravages they commit upon their structures in which they have their seat.

Such is the course of synochus under different degrees of violence. When it is combined with subacute cerebral affection, that course is usually terminated in from three to six weeks; when with acute cerebral affection, in from seven to ten days.

As an illustration of each form of the disease, as it is commonly met with in practice, I subjoin the following cases.

Case I.

John Colebert, æt. 28, admitted into the Fever Hospital August 1, 1828.

Attacked five days ago with chilliness, alternating with heat, pains of limbs, head-ache, and sense of weakness. At present complains of pain of head, with slight giddiness; pains of limbs, especially of

back and lower extremities; skin moderately warm; tongue loaded with white fur; much thirst; three stools; respiration natural; no cough, no uneasiness in chest; no epigastric or abdominal tenderness on full pressure; pulse 96, soft.

6th. Skin natural; pain of head gone; pain of back and limbs continues; slept better; tongue more clean; three stools; pulse 102.

7th. Pain of head not returned; pain of limbs better; tongue still cleaning; three stools: pulse 96.

9th. Pain of limbs gone; tongue nearly clean; two stools; pulse 84.

10th. Convalescent.

13th. Dismissed cured.

Case II.

George Walker, aged 17. Admitted May 5th, 1828.

Six days ago seized with shivering, succeeded by heat, loss of strength, and pain of head. At present complains especially of head-ache; ardent thirst; no pain of chest; no cough; no pain of abdomen, back, or extremities; skin cool; face natural; tongue, except at the point, covered with a thick dirty fur; much thirst; no appetite; sleeps badly; bowels costive, having had no stool for the last three days; pulse 98, of good strength.

7th. Heat of skin nearly natural; pain of head

almost gone; no pain of limbs; tongue still much loaded; some thirst; three stools; pulse 72; slept much better.

8th. Tongue much less loaded; less thirst; five stools; pulse 60.

11th. Convalescent.

14th. Return of head-ache, and, on the day following, the tongue again became white; but these symptoms disappeared the succeeding day, and, on the 27th, he was dismissed cured.

These two cases afford fair specimens of the combination of symptoms, and of the degree of their severity, in the synochus of London, as it occurs in its mildest form.

Case III.

Emma Gladish. Admitted into the hospital on the 12th day of fever. Attack commenced with usual symptoms. The pain in the head, which had been severe for some time, had entirely subsided on the day of her admission. The mind was now quite indistinct; she could scarcely answer any question that was put to her; the eyes were dull and heavy; she had no sleep; there was great restlessness, and occasionally wandering delirium; there was no tenderness of abdomen; the tongue was red, furred and dry; the stools were passed in bed; the pulse 105, of good power.

13th. Sleep rather more tranquil; less wandering; mind a little more distinct; stools still passed in bed; pulse 100.

14th. Much noise through the night; occasionally started out of disturbed sleep with screaming; tongue red, glazed and dry; stools passed in bed; pulse 96.

15th. Rather more sleep; talkative delirium; tongue somewhat cleaner; pulse 100.

16th. Longer and more tranquil sleep; mind more distinct; expression of eyes still dull and heavy; tongue more clean, more moist; stools only partly passed in bed.

17th. More sleep than on the preceding night; mind still more distinct; complains to-day of some tenderness of abdomen on pressure; tongue nearly clean; two stools no longer passed in bed; pulse fallen to 72.

19th. Slept well; mind clearer; eyes more animated; expression of countenance brighter; other symptoms the same.

26th. Continues to improve; skin cool, soft, and moist; pulse 78.

27th. Convalescent; but the convalescence was slow and tedious, as it almost always is after so severe an attack of cerebral disease; she was dismissed cured on the 40th day from the commencement of the attack. The reports of the 15th, 16th, and 17th days illustrate very clearly and strikingly the changes which have already been stated to indicate recovery.

Case IV.

Elizabeth Price, æt. 26, servant; admitted on 11th day of disease. Attacked with ordinary symptoms of fever: at present complains of very severe head-ache; face flushed; intolerance of light; some deafness; mind confused during night; visions of various kinds, such as "waves of the sea rolling," appear occasionally before her with great vividness; had been on sea four days before she became ill; skin warm; sense of general soreness; abdomen rather hard, but not tender; tongue furred, rather red; much thirst; no appetite; scarcely and sleep, and, when she does, dreams of a frightful nature interrupt her rest; pulse 114, *intermittent*, of good power, but easily compressed; bowels constipated. C. C. ad ℥xviij. nuchæ. Abradat. Capillitium. Lot. Gelid. cap. Haust. Sennæ Sal. c. m.

12th. More sensible since cupping; mind still confused; occasional wandering; scarcely any sleep; pulse 124, sharp, yet easily compressed.

14th. Quiet night, with considerable sleep; head giddy and slightly painful; respiration hurried, apparently cerebral; pupils active; tongue dry; much thirst; pulse 123. Empl. Lyttæ cap.

15th. Much screaming; great restlessness during night; complains much of head-ache; pupils active; urine copious, but passed in bed; all the stools

passed in bed; pulse 108, easily compressed; has visions before her almost constantly; head very hot. Four leeches have been applied to the temples this morning without relief. Affus. Frigid. cap. ℞. Hydrar. Submuriat. gr. ij. Pulv. Scillæ, gr. j. Pulv. Antimon. gr. iij. M. sumat 4tâ q. h.

16th. No screaming; head less painful, especially when in half-erect posture; mind quite sensible now, but much wandering occasionally; pulse 120, feeble; five stools passed in bed.

24th. No material change until this day; sleep now greatly improved; mind much more itself; tongue beginning to clean; pulse 93; ptyalism.

28th. Ptyalism continues; feels greatly better; appetite returning.

From this period she continued to improve, although with several threatenings of relapse; the convalescence was slow and precarious, but she ultimately left the hospital quite well, though not until the 60th day from the commencement of the fever.

Case V.

Mary Sullivan, æt. 36. Admitted on 14th day of disease; complaint commenced with shivering; pains in the limbs; severe head-ache. Complains now of violent pain of the head; face pallid; expression depressed; scarcely any sleep; abdomen

tender on pressure; only one stool for eleven days; tongue foul and dry; pulse 81, not strong; complans, also, of pain under right mamma, preventing inspiration and decubitus. V.S. ad ℥xij. Lotio Gelida cap. Abrad. Capillitium.

15th. Blood with firm buff; pain of head not at all relieved; pain of back, sides, and abdomen severe; no delirium; no sleep; pulse 78, pretty strong. Hirudines viij. temporibus. Pt. Med.

16th. Pain of head much relieved; slept very much better; pulse 66, full and strong.

17th. Pain of head returned, exceedingly severe over the fore-part; pulse 66, full and strong. C.C. ad ℥xij. nuchæ. Pulv. Aper. Mit. h. s. Ol. Ricini c. m.

18th. Pain of head gone; countenance more natural; tongue more clean and moist; pulse 76, more soft. Pt. Med.

20th. Pain of head returned; mind confused; pulse 60, strong and full. C.C. ad ℥viij. nuchæ. Pt. Med.

21st. Pain of head gone; mind confused; pulse 66, pretty strong.

22d. Pain of head returned, but in a slighter degree; mind more confused and dull; scarcely any sleep; tongue more foul; pulse 72, soft. Pt.

24th. No longer conscious of pain; mind quite indistinct; lies prostrate on the back perfectly helpless; incapable of turning on the side; occasional

retching; some tenderness of abdomen on pressure; pulse 72, strong and full.

25th. Much restlessness; aspect of countenance greatly depressed; stools passed in bed; pulse 75.

26th. Perfectly senseless; almost constant moaning; extreme restlessness; difficult deglutition; pulse 120.

27th. Not spoken since last report; lies prostrate on back; eyes half open and injected; pulse 102, feeble.

29th. Died.

If the reader can doubt of the condition of the brain in this case, he is requested to turn to the pathology, where the morbid appearances on dissection are detailed. Slowness of the pulse, with severe and obstinate pain in the head, attended with confusion of mind, is always a highly dangerous symptom: it invariably denotes intense cerebral disease. Whenever there is such a struggle, as this case exhibits, between the physician and the disease, the disease is sure to conquer. For if the physician, terrified at the name or the duration of the malady, while he resolve to use the lancet, hesitate to employ it to the extent of subduing the disease by the first bleedings, the patient is lost. The partial relief afforded by partial measures is most delusive. The malady speedily recovers its lost strength: the patient never does. There is no practitioner who is capable of being taught by experience that can reflect on the

history and progress of such a case as this, on the temporary relief afforded by such treatment, on its ultimate failure, and on the appearances presented on dissection, without regretting that more blood was not taken on the 15th and 16th days, and without at the same time resolving, that the aid he offers in future, under similar circumstances, shall be more decisive. The diminution of the pain of the head on the 22d, accompanied with increasing confusion and dulness, with a tongue growing more and more foul, and with a pulse only at 72, might well excite alarm; and accordingly, on the following day, the case was utterly without hope.

II. Synochus Gravior with Thoracic Affection.

There is probably no case of fever, however slight, in which the mucous membrane of the bronchi remains in a perfectly sound state. A certain affection of this membrane, the nature of which will be stated hereafter, appears to be peculiar to fever, and there is reason to believe that the acutest thoracic affection which is at the same time truly febrile, differs from the mildest case of fever, in which there may be no visible sign of any thoracic disease whatever, only in the degree in which this organ is affected. Sometimes it happens, however, that this membrane is implicated in a more than ordinary degree; and when it is so, it gives rise to peculiar symptoms, con-

stituting the case thoracic. The severity of these thoracic, is not always in proportion to the severity of the febrile symptoms, in like manner as there may be the most intense febrile symptoms, without any indication of thoracic disease: but whenever the thoracic symptoms are sufficiently intense to become prominent, and especially when they occur early or attend on the commencement of fever, they invariably and very considerably aggravate the general febrile symptoms. In these prominent thoracic affections, then, two things happen; first, the symptoms properly constituting the febrile train are modified, and, secondly, new symptoms are added to this train, namely, those which indicate derangement in the respiratory organs.

The new and peculiar symptoms to which a moderately acute and an early thoracic affection gives rise, are the following; namely—

Pain in the chest, sometimes severe, sometimes only slight; sense of stricture or dyspnœa; inability to expand the chest by a full inspiration without pain or uneasiness; cough frequently aggravating the pain; sometimes dry, sometimes accompanied with frothy mucous expectoration. Respiration sometimes slow and heavy, at other times, on the contrary, short and quick; never natural: perhaps the physician may detect thoracic disease in the more obscure, and measure its extent in the more obvious cases, by observing the manner in which

the patient breathes, better than by any other single means. The altered respiration is very frequently accompanied with that peculiar noise in breathing which is termed "mucous rattle."

The pulse, in the commencement of this open and decided chest affection, may not be above 80 or 90; it is hardly ever sharp; it is generally weak; now and then it is full and of good strength; but whatever other character it may possess it is almost always soft. In a few days, as the disease advances, it uniformly rises in frequency and becomes weaker. Towards the end of the disease it is almost always hurried and feeble, although cases occasionally occur in which it is observed at this period to become suddenly slow and intermittent. The tongue is usually foul; commonly moist; but, in severe affections and in their advanced stage, it sometimes becomes dry. The skin is often moderately warm, but it is never intensely hot: it is much more common for it to be cool, and to be of a more dusky colour than natural.

Such are the usual conditions of the respiratory and circulating systems and of the tongue, the great index of the state of the mucous membrane of the alimentary canal, when the thoracic affection increases so as to become prominent and acute. The manner in which it influences the cerebral affection is commonly by hastening the period at which the pain of the head lapses into confusion and stupor. Early insensibility, assuming the form of a muddled

or exceedingly confused state of mind, is a very constant symptom of more than ordinary thoracic affection. Accordingly, the delirium which succeeds or which accompanies this state is always low muttering talkativeness, or incoherent wandering, rather than violent delirium, which last is seldom, if ever, found in combination with severe thoracic disease. The pathological condition of the lung perfectly accounts for this modification of the condition of the brain, as will be shown hereafter.

Case VI.

The following case not only shows the insidious manner in which thoracic disease may come on and the severe form it may ultimately assume; but also, the extent of disease from which it is possible that recovery may take place.

Mary Dillon, æt. 20; destitute. Admitted on the 8th day of fever: attack came on with the ordinary symptoms: at present, no pain of chest; some cough, with copious expectoration; no pain or tenderness of abdomen; tongue not much loaded, but dry; much thirst; no appetite; bowels freely open from medicine; no pain of head; some giddiness; no sleep; skin warm; face flushed; pulse 102.

9th. Pectoral and cerebral symptoms the same; bowels purged; pulse 96.

10th. Only slight cough; pain of head; more

giddiness; no sleep; eyes preternaturally bright and glistening; pulse 120.

11th. Only slight cough; pain of head much relieved; slept better; tongue more clean; four stools; pulse 120, strong.

12th. No pain of chest; cough much increased; now very frequent and accompanied with copious expectoration; pulse 136.

15th. Cough more frequent; expectoration purulent and mixed with blood; pulse 126.

17th. Expectorates a larger quantity of purulent matter, mixed with a larger proportion of blood; pulse 102.

20th. Pectoral symptoms unchanged; strength extremely depressed; countenance pallid; skin cool; three stools partly passed in bed; pulse 84; mind confused; almost constant moaning; extensive sloughing ulcers on sacrum and hips.

21st. Pectoral symptoms the same; powers extremely depressed; three stools passed in bed.

22d. No change in the cough or the expectoration; lies quite prostrate and appears to be sinking; four stools passed in bed; pulse 72, rather less feeble.

24th. Cough rather diminished; expectoration unchanged; four stools passed in bed; pulse 84, extremely weak.

25th. No change, excepting that the pulse (78) is rather more strong, and she is scarcely so prostrate.

26th. Skin again hot; tongue again red and dry; no sleep; some delirium; pulse 84, of more strength.

27th. Skin more cool; tongue less red and more moist; pulse 66; some return of appetite.

28th. Cough much diminished; expectorates less; tongue moist, clean, and nearly of natural colour; pulse 72, stronger; countenance more animated.

35th. Cough nearly gone; expectoration much diminished; tongue clean; one stool; countenance improving; strength increasing; wishes for meat; two ounces were allowed.

40th. Sloughs on sacrum and ilium doing well; pulse 90, of more power; still noisy during sleep.

From this period she continued slowly, although gradually, to gain strength, and was dismissed from the hospital on the 57th day, *cured.*

Case VII.

Angelica Fidgett, æt. 29, married. Admitted on the 16th day of fever. Before admission affected with cold, shivering, sense of faintness, pain of head, uneasiness of chest, and cough. On admission, pain of chest increased by deep inspiration and by cough; cough frequent; pain of the head already subsided: there remain only a sense of weight over the eyes, the expression of which is dull, heavy, and vacant; frequent moaning; no pain of the abdomen on full

pressure; pulse 129; tongue foul, moist; skin hot; face flushed.

17th. Respiration slow and laborious; cough; completely comatose; eyes suffused; pulse 120, full, soft; face flushed.

18th. Respiration continues very laborious; mind exceedingly indistinct; much restlessness; pulse 116, still softer.

21st. Examined with the stethoscope: the bronchial roll and crepitus were very distinctly and generally heard.

22d. The respiration continues extremely laborious; frequent cough, without expectoration; low, rambling delirium; pulse 112, weak; tongue foul, moist; general powers greatly depressed.

23d. All the symptoms aggravated. Died on the 24th day of fever.

As thoracic affection may exist in any degree of intensity, so it may indicate itself at any period of the disease: but while sufficiently intense to destroy the structure of the organs in which it has its seat, yet it sometimes gives no indication of its presence, or none until the approach of death. In these cases, the cerebral affection is still more intense than the thoracic, and the manifestation of the symptoms, proper to the lung is prevented by the predominance of disease in the brain. Of this, the following case affords a striking example.

Case VIII.

John Potter, æt. 21. Admitted on the 15th day of fever. Before admission was affected with the usual febrile symptoms, accompanied with severe pain of the head and giddiness. On admission, the pain of the head was nearly gone; there remained considerable vertigo, with some pain in the loins and joints; the mind was exceedingly indistinct, and there was little or no sleep; pulse 80, soft; no indication of pectoral affection.

18th. Symptoms the same; in addition, the abdomen was now tender on full pressure and retracted.

24th. No change observable until this day; no indication of thoraic affection had hitherto been apparent from the commencement of the disease; but, on the morning of the 24th day of fever, dyspnœa suddenly came on, which was attended with a great degree of restlessness; there was also some soreness of throat, but only a slight degree of redness and tumefaction were visible on inspection: with these symptoms he sunk rapidly, and expired in the afternoon.*

* See pathology—chest cases. John Potter.

III. Synochus Gravior with Abdominal Affection.

One of the organs always involved in disease, in a greater or less degree, in fever, is the mucous membrane of the stomach and intestines. In synochus mitior the affection of this organ appears to be slight, and to pass away without producing any change in its structure. But that it is really diseased even in the mildest case, we have sufficient evidence in the invariable derangement which takes place in the functions of the organ throughout its whole course, from the mouth to the anus; and in the constant vitiation of its secretions and excretions. In the severer forms of fever, on the other hand, in the great majority of cases, the affection of the abdomen becomes prominent, and whenever it does so it aggravates all the other febrile symptoms, and adds greatly to the danger of the disease.

Abdominal affection exists under two forms in fever, each of which is attended with distinct and peculiar symptoms. It may be severe from the commencement, and give early and obvious indications of its existence; or it may come on at some subsequent stage of the disease, and then, although the affection be equally severe, the symptoms which denote it are materially different.

1. If the abdominal affection be severe from the

commencement, in addition to the ordinary symptoms of fever, there will be present nausea, sometimes retching, and at other times vomiting. It is usual for authors to enumerate these events among the ordinary occurrences of fever; but in a case decidedly cerebral, or in a case decidedly thoracic, they are seldom present. Whenever they occur in the commencement of fever they are the certain signs of an abdominal affection more severe than ordinary; and it will be of the utmost advantage to the patient should the practitioner be aware of this, because it will teach him at once where the main force of the disease is probably to be concentrated.

2. At this early period the bowels are commonly constipated, and on inquiry it will be found that they have been so for some days previously to the attack of fever; but in a day or two after the commencement of this attack they fall into the opposite state and are looser than natural. The concurrence of nausea, retching, vomiting, and purging in the commencement of fever is a certain proof that severe abdominal affection is present, and if not actively treated and effectually checked at this early stage, it will soon render the case formidable, if not hopeless.

3. When the abdominal affection is thus early and open, it is often attended with another symptom which seldom fails to attract attention, namely, pain. Pain of the abdomen, attended with purging, com-

pletes the train of local symptoms that occurs at this early period, in the most exquisitely marked cases. It is well worthy of observation, however, that pain is by no means an invariable attendant on the other symptoms, even when the latter are very severe. Whether in these cases the affection of the nervous system be already so great as to lessen the sensibility of the organ, or whatever else may be the cause of it, the fact is certain, and it is one of great practical importance, that pain of the abdomen is not to be expected even in severe abdominal affection; and that though pain may attend upon the affection, yet the affection is often present without pain.

4. Pain of the abdomen upon pressure, and especially upon pressure in the epigastrium, is much less seldom absent than pain of which the patient spontaneously complains.

5. Pain, though it may usher in the abdominal affection, and may even be severe for the first few days, diminishes after a certain time and then ceases altogether, so that it is extremely rare, after the tenth day of fever, for instance, for the patient to complain of pain of the abdomen, even when the abdominal affection is the most intense. Such an event may happen, perhaps when the cerebral affection is more than commonly slight, but it is an exceedingly rare occurrence, and my attention has been particularly drawn to this circumstance from reflecting on the uniformity of the answers which I have

obtained from patients obviously labouring under abdominal affection, on my first visit to them in the wards of the hospital. Having commonly been ill from ten to fourteen days, the abdominal affection may by this time be fully developed: on asking them whether they feel any pain in the abdomen, the answer almost invariably received is, "no." Press gently upon the abdomen, press especially upon the epigastrium, often even in these very cases not the slightest touch can be borne. After pressure has once been made, the patient will frequently do all he can with his hand to prevent its being made a second time. So acutely sensible is he of pain on the least pressure, though wholly unconscious of pain when left to himself. Even when there is not this great degree of tenderness, pain can generally be produced by full pressure.

There is thus a remarkable coincidence between the progress of the symptoms in the abdomen and in the head. We have seen that however intense the cerebral affection, the pain of the head which accompanies it diminishes after a certain time, and in a day or two after it has begun to diminish, ceases altogether. In like manner the pain which ushers in an acute abdominal affection diminishes after a certain time, and soon wholly disappears. After this period, therefore, we should have no more indications of abdominal than we have of cerebral pain were the intestines, like the brain, enclosed in a bony

case. When an organ can be touched, it gives us an additional and an invaluable means of ascertaining its morbid condition: and this is one reason why that condition is commonly so much more certainly known in surgical than in medical diseases. What the result would be, could we press the brain as we can the abdomen, after its sensibility is so much diminished as to cease to occasion pain, we do not know; but it would be a bad use indeed to make of the additional means afforded us of ascertaining the condition of the intestines, were we to allow the additional information we thus gain, to obscure our perception of the perfect analogy there is in the progress of both affections. We know that, as the disease advances in both, the pain ceases; but, in the one case, we have the means of ascertaining that there still remains preternatural tenderness on pressure, as in ordinary inflammation, which we are without the means of discovering in the other: still the important practical fact afforded by the history of both is the same, that disease having reached a certain point, the pain diminishes; and having advanced still further entirely disappears.

6. While the pain lessens or ceases as the abdominal affection advances, the purging, on the other hand, continues, often it increases. Purging, succeeding to constipation and to pain, and remaining after the subsidence of the pain, affords an infallible indication of abdominal disease.

7. Together with these decisive signs, which alone are abundantly sufficient to enable us to ascertain the presence of the affection, we have an additional and an exceedingly valuable guide in the peculiar state of the tongue. In these abdominal cases, the tongue is preternaturally red. Sometimes this increased redness is of a bright and vivid colour, and pervades the whole tongue; at others, it is confined to the edges or to the tip, and it is usually remarkably apparent in the latter. While thus vividly red, the body is often loaded with fur; the colour of the fur is often of a dirty-white or greyish colour; but, perhaps, while the edges and the tip are thus intensely red, the most usual colour observed on its body is that of a dirty yellow. In these cases, the papillæ appear much enlarged, and are seen prominent through the fur, vividly red. In this condition of the tongue it always remains moist for some time, and it is not attended with urgent thirst; but, as the intestinal disease advances, the tongue gradually becomes less vividly red and more dry, and as these changes go on, the lips and teeth often become sordid.

Instead of being from the commencement of a vivid redness, the colour of the tongue, in other cases, is of a darker and duller tint; there is less fur upon the body, and that which covers it is of a dirtier and darker tinge; this state of the tongue is always attended with greater thirst: it is apt to be-

come more and sooner dry, and, at the same time, the lips and teeth become more and sooner sordid.

8. In the kind and degree of abdominal affection of which we are now treating, the abdomen is sometimes harder than natural, but it often remains nearly as soft as in health through the greater part of the disease.

9. Of the conditions of the pulse in this affection it is important to take particular notice, on account of the total absence of any striking or *apparently* distinctive character. It is neither remarkably slow nor very quick; neither unusually hard, nor strong, nor sharp, nor weak, nor intermittent, nor in any degree irregular; its common range is from 80 to 100, beyond which it seldom rises in the acutest cases, until near the termination of the disease; and it is generally soft.

10. Whenever, then, there is a combination of the preceding symptoms, with a pulse about 90, it may be inferred with great certainty, that disease is going on in the intestines. But, as the pain of the abdomen ceases at a certain period, while the purging continues, so, at a still more advanced stage of the disease, the purging also disappears, and the stools return to a more natural condition. Cessation of pain, and an apparent return to healthy secretion and excretion, may seem to indicate a highly favourable change in the disease, and, *if accompanied with corresponding amendment in the other symp-*

toms, they may, indeed, be hailed as signs of returning health; but if they occur *without* a favourable change in the general symptoms, they do not indicate a return to health, but merely the transition of one diseased process into another. What that succession of diseased processes is will be stated hereafter: at present it is sufficient to observe that, without corresponding improvement in other organs, the cessation of purging is a sign not of returning health, but of advancing disease. And so common is the cessation of purging, *without amendment*, at an advanced stage of abdominal affection, that in a large proportion of the patients who are received into the Fever Hospital, it has ceased before their admission. On the examination of a patient, for the first time, who has been ill from a fortnight to three weeks, it will be stated that the stools are regular, yet if strict inquiry be made, it will often be found that at an earlier stage of the disease from four to five stools, sometimes from eight to ten, were passed in the twenty-four hours without any purgative medicine having been taken. With regard to the state of the evacuations in this affection, then, the succession of events is first constipation, then purging, and next the cessation of purging and the return of the stools to a more natural character.

The preceding signs of abdominal affection are so obvious that they can scarcely fail to lead to the detection of the disease; but the second form under

which it exists is attended with much less striking symptoms. It requires great attention and daily examination to discover its presence, and to trace its progress. It steals along its fatal course with a step as silent as it is sure; and the destruction that marks its track is oftentimes alike unfelt by its victim and undiscovered by his most watchful guardian. It does not attack until the sensibility is already greatly diminished in consequence of the progress of cerebral disease. No pain is therefore felt, and the only indication by which it can be detected is tenderness of the abdomen on pressure. But even the fullest pressure, although it generally excites some uneasiness, sometimes produces none whatever. There is often no purging; for when the affection comes on thus late, though the bowels may sometimes be loose, yet they are frequently even constipated. The tongue is generally red at the edges and the tip, loaded with dirty grey or yellow fur, and sometimes dry. The pulse at this advanced period is generally 120. Without doubt this affection greatly aggravates the severity of the fever, and increases the danger of the patient, although we have no means of measuring the extent to which it does so.

On recovering from this state, for recovery does sometimes take place, the first indication of improvement commonly appears in the tongue, which shows a disposition to clean; and what is remarkable, the favourable sign which accompanies this improved

condition of the tongue is *increased tenderness of the abdomen on pressure.* Not that disease in the intestine is increasing, but disease in the brain is lessening, and therefore the patient is now sensible to a stimulus which before produced not the slightest impression. If on the following days the tongue continue to clear; if it grow less red; if at the same time the pulse fall, the sleep return, the sensibility increase, and the countenance become more animated, the patient may be considered as convalescent.

It is not very common, but it does sometimes happen, that a few hours before death the sensibility of the abdomen suddenly increases, and the tenderness on pressure becomes exquisite. This remarkable change is sometimes attended with vomiting, sometimes with hiccup, and is accompanied with extreme restlessness, and a highly excited pulse, while the expression of the countenance is at one time anxious and at another wild, and in this state the patient dies in a few hours. On what change in the intestines this depends will be explained in the pathology.

As illustrations of these different modifications of abdominal affection the following cases are subjoined.

Case IX.

Eleanor House, æt. 18, silk-winder. Before ad-

mission attacked with nausea, vomiting, together with the ordinary symptoms of fever. On admission, being the 8th day of the disease, severe pain of addomen, which is greatly increased on pressure: tongue very red at the point, loaded with fur, through which the papillæ are prominent, moist; urgent thirst; no appetite; bowels said to be natural; some uneasiness of chest; respiration hurried; cannot lie with ease on either side; voice hoarse and feeble; no soreness of throat; no head-ache; no sleep; skin warm; face flushed; pulse 100, of some power, but easily compressed. V.S. ad ℥xvj. Ol. Ricini, ʒiij.

Hora 3tia, p. m. Blood with thick and firm buff; symptoms both of abdominal and thoracic disease diminished. Vespere versus vel cras mane, rep. V.S. ad ℥xvj. si opus sit. Pulv. Aper. Mit. h. s. haustus Sennæ Sal. c. m.

9th. Bled last evening with much relief; proportion of coagulum of blood last drawn great, and covered with firm buff. Much pain in the epigastrium and over the whole abdomen independently of pressure, but greatly aggravated by slight pressure; tongue less loaded, less red, moist; much thirst; pulse 108, sharp, small, easily compressed. Rep. V.S. ad ℥xvj.

10th. "Feels greatly better;" pain of epigastrium gone; none of abdomen when not pressed; full pressure much more easily borne; tongue unchanged;

thirst; vomiting; four stools; pulse 108, of the same character.

12th. Pain not diminished on pressure; nausea, vomiting, rejection of a large quantity of green fluid; pulse 118.

16th. Says she is quite free from pain of the abdomen; bears pressure without flinching; no vomiting since last report; four stools; tongue clean and moist; pulse 99; sleeps better, but the mind is dull and confused: wandering delirium through the night; some muscular tremor; skin cool; face flushed.

18th. Pain of abdomen returned; mind confused; delirium.

23d. Says she is without pain but feels oppressed; pulse 96; slept better; no delirium; face more animated; skin warm; no flushing.

27th. Had been steadily improving until this day, when the pain of the abdomen returned, which is again tender on pressure; tongue clean; one stool; pulse 110.

29th. Pain much relieved since the application of six leeches to the abdomen, followed by a large poultice.

30th. Pain gone: only slight tenderness: pulse 96.

32d. Pain and tenderness again returned; tongue more red; pulse 108.

33d. Six leeches were applied last evening without

the slightest relief of the pain or tenderness; tongue red: pulse 96, more weak and soft.

34th. Tenderness considerably diminished; tongue less red; countenance again improved.

35th. Still less tenderness than yesterday; bears pressure much better; tongue nearly natural; two stools.

39th. Improving every day; no pain of abdomen; no tenderness on fullest pressure; bowels quite soft; tongue natural; four stools; pulse 72; appetite good: strength increasing.

44th. No return of uneasiness; continues to gain strength.

57th. Since last report has been daily improving, and is now quite well. Dismissed cured.

Case X.

Sarah Raven, æt. 17. Admitted on the 22d day of fever; no pain of the abdomen appears to have been complained of from the commencement of the attack; at present no tenderness on the fullest pressure; some distention; tongue covered with yellow fur, moist; bowels loose; pulse 110, sharp; only slight pain in the head; more pain in the limbs; mind dull, confused; deaf.

24th. No pain of abdomen on fullest pressure; tongue the same; only two stools; pulse 124; voice hoarse, feeble; respiration hurried; skin dark, almost livid; mind much more confused; delirium.

25th. No material change.

27th. Insensibility increased to coma; features shrunk; one stool passed in bed; pulse 128; skin livid, cold.

28th. Moribund; died the following day.

On examination after death (see pathology) extensive disease was found in the intestines, although, if the purging on the day of admission be excepted, not the slightest indication of it was given during life.

Case XI.

George English, æt. 25, carpenter. Admitted on the 29th day of fever, with a great degree of tenderness of the abdomen, extending especially over the hypogastric region; bowels said to be regular; pulse 90, of good strength; yet complains much of sense of debility.

30th. Pain of the abdomen continues, especially over the region of the bladder; urine passed in good quantity and freely; three stools; pulse 84.

32d. Tumour has appeared over the region of the bladder, unattended with pain; three stools; pulse 76.

33d. Hypogastrium still tumid, but without pain; other symptoms the same.

43d. No material change until this day, when he was suddenly seized with exceedingly acute pain in the region of the bladder; extreme tenderness on

pressure; great restlessness, and great anxiety; vomiting of a yellow-coloured fluid; two stools; pulse 84, extremely feeble.

44th. Died.

These acute symptoms mark the very hour when the event occurred which caused them.—See Pathology.

IV. Synochus Gravior with Mixed Affection.

Since it has been repeatedly stated in the preceding pages that, in every case of fever, the brain, the lungs, and the abdomen are diseased, it may appear objectionable to call any particular class of cases mixed, because, according to the very nature of fever, all must be of this character. But for the same reason that we have designated one class of cases cerebral, another thoracic, and a third abdominal, namely, to mark prominence and intensity of affection, it is right to distinguish a fourth, in which all the three systems of organs are simultaneously affected with an equal, or nearly an equal degree of intensity. The term mixed is therefore by no means employed to intimate that the cases not comprehended under it are unmixed, but merely to point out a fact of great practical importance, that cases do occur which are neither in an exquisite degree cerebral, nor thoracic, nor abdominal, but which, at one and the same time, afford the most exquisite specimens of all the three.

From this account of the sense in which the term is employed, it must be obvious that it will include the severest cases that can occur. If a patient be affected with intense cerebral disease he may be in great danger; but if he be affected with an equally intense thoracic disease his danger must be doubled: and if to this be added an equally intense abdominal disease it must be trebled. And accordingly these are just the cases which bid defiance to the most skilful and vigorous measures which the medical art can employ to control them; which seize upon their victim with a force which no human agency can resist nor counteract; which in malignant epidemics destroy life in a few hours or in a single hour, and in ordinary seasons in a few days.

Whenever a severe case occurs without exhibiting any striking prominence of affection in any organ, and when on examining the organs there are found indications of severe affection in all of them, that case is sure to become formidable, and the patient and his physician have reason to congratulate each other if it do not prove fatal. When prominence of affection in any one organ is absent, because all the organs are intensely affected, it constitutes the most formidable case that can occur. And though this kind of case be but too common, yet after all it does not appear to happen as often as it really takes place. Examination after death discloses what was unknown during life. The brain, the lungs, the

abdomen are often found to be most extensively diseased, while the indications of disease were confined, perhaps, to the brain and the abdomen, or to the brain and the lungs. Without doubt, the spinal cord and the brain are the grand and original seats of disease; the others are subsequent and consequent, and the principal masks the subordinate. It is when a great number of cases are brought together, and placed in juxta position, that we are impressed, and it is only then that we are duly impressed, with the great proportion of those in which the course of disease is as noiseless as it is destructive; in which its stroke destroys, without its being possible to tell where it falls; in which the physician sees that his patient must die, but in which the anatomist, after the event has happened, can alone pronounce why it was so.

Whatever be the number of organs simultaneously affected, the nature of the affection in each is always the same, and is not in the slightest degree changed by the complication. Disease in the brain is the same, whether the brain alone be prominently affected, or the brain and the intestines, or the brain, the intestines and the lungs. Each organ is liable to its own specific disease, and that disease goes on with the utmost regularity, whether it be the sole organ so far diseased as to suffer a change in its structure, or whether many be simultaneously affected in the same manner.

In like manner the symptoms, when any symptoms are present, are essentially the same, whether the disease exist alone, or whether it be complicated with several others. The symptoms of inflammation of the brain are the same, whether cerebral inflammation alone be present, or whether it be complicated with inflammation and ulceration of the mucous membrane of the intestines. And the symptoms of inflammation and ulceration of the mucous membrane of the intestines are the same, when any symptoms are present, whether these affections exist alone, or whether they are complicated with cerebral inflammation. The occasional absence of symptoms in the subordinate organs, overwhelmed by the preponderance of affection in the principal, is a proof that they are subordinate. It would, therefore, be useless to detail the symptoms which occur in the mixed cases, since they must only be a repetition of those which have been already enumerated. Their concurrence in individual complications, and the modifications they undergo from such particular combinations, will be best understood from the study of the cases.

An examination of large averages clearly shows, what would scarcely have been expected, and what is by no means generally understood, that these mixed cases, instead of being rare, are even frequent. It seems to me to be impossible to study the pathology of those which will now be laid be-

fore the reader, without perceiving that the opinion that the seat of fever is invariably fixed in some *one* organ, is founded in partial, and, therefore, imperfect views; and I earnestly solicit the attention of those who have hitherto contended for the strict locality of that seat, to these very interesting and instructive cases. It was by slow degrees, and after the study of these symptoms as they occur in all varieties, and, if I may so speak, shades of type, *in connexion with the morbid changes apparent after death*, that I was able to make out, what I have so often stated to be, the true circle of organs upon which the disease always seizes and always preys, and which it often irreparably destroys. In some of these mixed cases, we see marks of irreparable destruction in this entire series of organs; and in every one we see extensive disease in all of them. Coupling, then, as we ought always to couple, these ascertainable and ascertained conditions of the organs in the fatal cases, with the symptoms of derangement manifested by these organs in *all* cases, whether fatal or not, a body of evidence presents itself, which appears to me to be irresistible, to justify the conclusion that the local seat of fever is at least coextensive with these organs. A repetition of my own conviction cannot, I know, produce conviction in others; I, therefore, again entreat attention to the facts which have produced conviction in me. And in order that the cases to which I am so anxious

to direct the attention of the pathological student, may afford him all the information they are capable of communicating, at the least expense of labour to him, they have been arranged in succession, according as dissection shows that, while all the organs are deeply involved, the ravages of disease are most extensive in the organs of the head, or of the thorax, or of the abdomen. The simplest and mildest affections are placed first; the more complicated and severe, as nearly as possible, in the order of their complication and severity; while, in the rapid sketch that is drawn of the symptoms, those which relate to the organ most severely diseased are placed first; and the succession is detailed in order, according as they appear to be antecedents or sequents; or as they are observed to combine to form a train or series. Since cases abundantly illustrating, in this manner, every variety of complication, are given in the pathology, it is unnecessary to add any here.

CHAPTER IV.

Of Typhus: Division into Mitior and Gravior, and into Cerebral, Thoracic, and Abdominal. Typhus Mitior, with Subacute Cerebral Affection; with Acute Cerebral Affection; with Thoracic Affection: with Abdominal Affection. Typhus Gravior: in what it really consists: dangerous Nature of the Error that it consists in Debility.

The appearance of a person labouring under typhus is so different from that of a person affected with synochus, that no one ignorant of the disease, who saw these two patients for the first time, would believe that both were afflicted with one and the same malady. And yet dissection after death demonstrates, that the physical condition of the organs is precisely the same in both; and careful examination of the symptoms during life, shows that they are really identical, both in their nature and their succession, however, at first view, they may appear to differ. The difference between these two diseases arises entirely from a difference in intensity: still this difference produces a very important modi-

fication in the character of the disease; important, because it materially affects both the safety of the patient, and the nature of the remedies that are best adapted to rescue him from his danger.

Typhus, like synochus, presents itself under two degrees of intensity, which, like those of the latter, may be conveniently designated by the terms mitior and gravior. All the important symptoms which belong to both are found in the same cavities, and relate to the same organs, as in synochus, and, therefore, must in like manner be divided into cerebral, thoracic, and abdominal.

I. Typhus Mitior, with Cerebral Affection.

Cerebral affection in typhus, as in synochus, presents itself under two degrees of intensity, which may be distinguished by the same terms as in the latter, the subacute and the acute.

1. *Typhus Mitior with Subacute Cerebral Affection.*

The symptoms which denote this affection in typhus, are perfectly similar to those which have been stated to characterise it in synochus, but they undergo certain modifications, the true nature of which appears to me to have been greatly mistaken, and, after the most careful attention which I have been able to give the subject, the mistake seems to me to be of so much magnitude, that I think whosoever

shall effectually correct it, will do the greatest possible service to medicine, and, through it, to his fellow men.

1. There can be no question that, from the very first commencement of the attack, as well as through the whole course of the disease, the prostration of strength, both physical and mental, is greater in typhus than it is in synochus. This greater loss of energy is indicated by every sign that can be conceived to denote it. The loss of power in the muscles which support and move the body is oftentimes so complete, as to be most alarming to the patient and his friends; while the contrast between the vigour and the torpor of the mind, in the course only of a few hours, is most striking. From the full and active exercise of its faculties, it becomes, in that short space of time, quite incapable of performing any intellectual operation. It is confused and stupid, always in a greater degree than in synochus, and sometimes to such a degree, even on the very first day of the attack, as to excite the utmost apprehension in every one around the patient who takes any interest in his fate.

2. The chilliness is, upon the whole, greater and longer-continued than in synochus: yet there is less constantly shivering, and the heat, when it succeeds this state of chilliness, is seldom as great as in the latter; while there are cases in which the heat never exceeds the natural standard.

3. The febrile uneasiness is greater; the restlessness is incessant; the face is pallid; the features are shrunk; the expression of the countenance is most peculiar; it is strikingly indicative of weakness and suffering; the experienced eye can tell at a single glance, even at this early period, to which of the two types that countenance belongs. The pulse is always weaker and more rapid than in the corresponding stage of synochus.

4. There are cases in which the pain of the head is equally severe as in synochus: but this may be justly considered as rare. In general it is less acute. Dulness, confusion, stupor, giddiness, are more common than severe pain, and are often the substitutes for it. Though some degree of pain be generally present, yet it is by no means uncommon for one or more of these sensations to occupy its place completely. Question the patient as much as you please, and he will tell you that he has no pain; but it is evident from his aspect and his manner, that he has little sensation of any kind. The eye is dull, heavy, stupid, without lustre: the old English word "lac-lustre" expresses its character truly and strikingly. But it is remarkable, that while the pain in the head is only slight, the pains in the back, loins, and extremities, and, as the patient himself says, in the bones, are severe.

5. When pain is present it diminishes sooner and disappears more completely than in synochus: when

it is not present, the advancement of the disease is indicated by increasing insensibility, and by the rapid transition of dulness or confusion into a state of stupor approaching to coma. The eye is already muddy, and it soon becomes injected and suffused. The skin over the body is generally warm, sometimes hot: over the head it is often hot. The face is usually pallid, but the pallidness frequently alternates with flushing. The change of dulness into insensibility more or less profound sometimes takes place as early as the second or the third day: it is seldom that it is as late as the seventh or the eighth: it is postponed, when not prevented, by active and appropriate treatment.

6. There is little or no sleep; the restlessness is great; there may be no violence; but there is abundance of inquietude.

7. Delirium is more constantly present than in synochus; and when it comes it comes earlier: its presence is not unusual as early as the sixth or the seventh day; and it may appear still sooner, but that is rare. It consists of low muttering incoherence rather than of loud and violent talkativeness; and is expressed in moaning rather than screaming.

8. The connexion between delirium and muscular tremor, between muscular tremor and subsultus tendinum, and between both, and the passing of the stools and the urine unconsciously, has already been pointed out. Like delirium, muscular tremor is

much more constantly present in typhus than in synochus; and its relation to delirium is so close that it is sometimes observed to supervene on the very same day; frequently on the day following; and, if it appear at all, it is seldom longer absent than the third. Its degree likewise is commonly in proportion to the violence of the delirium; and though early and great delirium may appear without it, yet it very rarely appears without delirium; and in general all these symptoms form one series or train; pain disappearing, confusion of mind increasing, muttering incoherence supervening, and muscular tremor and involuntary and unconscious stools rapidly succeeding.

9. In the commencement of typhus the pulse is sometimes of good strength, and it may not exceed 90 in frequency; but as the disease advances it uniformly becomes weaker, smaller and quicker; so that death rarely takes place before it has reached 120. In the severer cases it is weak, quick, and easily compressed at a very early period.

10. The respiration is often not very obviously affected, but if it be attentively observed it will usually be found to be shorter and quicker than natural.

11. The tongue is always foul on the first or second day; it seldom continues moist longer than three or four days; it is often quite dry as early as the fourth, especially on the body and at the root; the apex and the edges sometimes remain moist a

day or two longer; but in a short time the whole tongue becomes perfectly dry and of a brown colour; as the disease advances the colour often changes to a darker and darker hue until it becomes quite black; it is then frequently fissured into deep chaps, while the lips and teeth soon become covered with a black sordes. Were the sensibility not greatly altered, such a condition of the mouth and tongue must be attended with insatiable thirst; yet thirst is often not felt, although at other times it is considerable.

12. In the early stage of typhus the skin is frequently hot; as the disease advances the heat lessens: through the greater portion of the disease it is moderately warm; towards its termination it becomes cool, and some days before death it falls below the natural standard. It is always of a darker colour than in synochus; the whole surface is of a dull and dusky tinge. Sometimes it is covered with dun coloured petechiæ, at others with petechiæ of a florid colour.

13. During its progress, erysipelas, first appearing on the face, then extending over the scalp, and often down the shoulders and back, is very apt to occur. Excoriation on the back and hips often form sloughing sores of great malignity and extent, while enlargement, inflammation and suppuration of glands situated in different parts of the body frequently appear.

14. Typhus terminates much earlier, whether fa-

vourably or unfavourably, than synochus; if it terminate unfavourably death frequently takes place as early as the 10th or the 14th day, although if early and appropriate treatment be employed, the force of the disease is sometimes so much lessened that it is as protracted as synochus.

Towards the termination of the disease more or fewer of the symptoms which it has been stated occasionally to occur in synochus,* supervene; but, as these depend upon particular conditions of the brain, they will be detailed under the pathology.

2. *Typhus Mitior, with Acute Cerebral Affection.*

In typhus with acute cerebral affection the pain of the head is often not more severe than it is in the subacute; but there is a greater degree of heaviness, or weight, or stupor, or giddiness; the eyes are more and sooner injected and more suffused; the insensibility comes on sooner and is deeper; the delirium appears earlier and is more violent, frequently requiring restraint, and the whole train of symptoms already enumerated, and which it is needless to repeat, are more intense in degree, and succeed each other with greater rapidity.

Case XII.

James Solden, æt. 44, plaisterer. Admitted on

* See page 119.

the 7th day of fever: attack came on with chilliness; great debility; some pain of head; sense of giddiness and weight; together with symptoms of thoracic disease. At present pain of head entirely gone; it has passed into insensibility; mind quite delirious; almost constant moaning; pulse 96, weak; tongue brown and dry; stools passed in bed; respiration short and hurried; cough without expectoration; tenderness of abdomen on full pressure.

8th. Insensibility more profound; restlessness and delirium increased; respiration more hurried; cough the same; stools passed in bed: pulse 92.

9th. No change.

10th. Died.

Case XIII.

John Clark, æt. 16. Admitted on the 4th day of fever: attack commenced with ordinary symptoms, and was attended with severe pain of the head, which continues at present, and which is attended with a sense of weight; eyes injected and suffused; expression of countenance extremely dejected; sleeps none; skin pungently hot, especially over the scalp; pulse 108, of good power; tongue already brown and quite dry; some thirst; respiration hurried; some uneasiness of chest on coughing; considerable tenderness of abdomen.

5th. Eight ounces of blood which were drawn not

sizy; crassamentum loose; pain of head not at all relieved; sense of weight distressing; no sleep; much restlessness; heat over the scalp pungent; pulse 104; tongue more dry; tenderness of abdomen the same; six stools.

6th. Pain of head still severe; mind more confused; passed a more restless night; pulse 116.

10th. Pain of head undiminished; eyes more suffused; extremely restless night, during which delirium came on; this morning muscular tremor has appeared; pulse 124.

12th. Pain of head entirely gone; scarcely at all sensible; constant muttering delirium; muscular tremor with subsultus tendinum; two stools passed in bed; pulse 124; abdomen still painful on firm pressure, and has become swollen and tense.

13th. Insensibility and delirium increased; constant incoherent muttering; extreme prostration; erysipelas has appeared on the forehead, and is spreading to the scalp: pulse 128; two stools passed in bed.

14th. Died.

II. Typhus Mitior, with Thoracic Affection.

Prominent thoracic affection, as we have seen, is not infrequent in synochus; in typhus it is more constant; and the signs which denote its existence are more obvious, but they are not precisely the

same. The pain in the chest is less severe; it is more often absent altogether; while the sense of stricture and the dyspnœa are more urgent. The cough is more constantly attended with mucous rattle; the respiration is shorter and more hurried. The skin in general is cooler, and it is always more dusky. The dark colour of the skin, in severe cases, becoming quite livid, is one of the most characteristic marks of intense thoracic affection. The colour of the cheek is at first of a deep and vivid red; as the disease advances it becomes of a purple tinge, and at length it is quite livid. In these cases it is not uncommon for the respiration to be from forty to fifty in a minute. The pulse is invariably rapid and weak. The cerebral affection is equally peculiar and characteristic; it never consists of intense excitement; it is never accompanied with violent delirium; it is indicated by confusion and stupor passing rapidly into coma; and it is attended with low muttering incoherence or disjointed rambling, the trains of ideas that pass through the mind being extremely faint, and linked together by no distinguishable affinity. We know that one of the most essential conditions to the due exercise of the sensorial faculties is the due supply of the brain with arterial blood; but in this state of the system arterial blood does not and cannot circulate through the brain, because it is not formed in the lung: the patient is in a state approaching to asphyxia, and in

very severe cases he remains for several days in as perfect a state of asphyxia as seems to be compatible with life. Why debility should, in these cases, be carried to the utmost possible extent; why such cases should form the most exquisite specimens of the adynamic state, need not be pointed out: the disease is concentrated in the very organ which elaborates the pabulum of life, and that stream which should convey its vivifying and animating influence to every nook and point of the system is corrupted at its source.

It is in these cases, too, that the tongue becomes dryer than in any other; in its advanced stage it is sometimes quite black and even hard, and is altogether incapable of being protruded. Sometimes it is covered with a thick, black and hard crust; at other times it is cut into deep fissures, so as to give it a cracked appearance. These states of the tongue without doubt arise in part from the excessive dryness, occasioned by the mouth being kept always open, on account of the difficulty of respiring.

Such are the most characteristic marks of thoracic affection in typhus; as an illustration of which, as it occurs, perhaps, in the severest form ever witnessed in this country, the following case may be cited.

Case IV.

Alexander Crombie, æt. 19, seaman.

The mate of his vessel states that, notwithstanding some previous indisposition, three days ago he was on duty; that while on watch, about eleven o'clock at night, he became too ill to remain at his post, and that, since that time, he has scarcely spoken a word. At present he is incapable of giving any account of himself. He is dull, stupid, and when roused, is scarcely able to answer coherently; he does not speak, but he is constantly picking at the bed-clothes; there is extreme restlessness; the countenance is heavy and inexpressive; the features in general are swollen, the lips especially, which are also extremely parched. The entire skin is dusky, but the cheeks are of a deep red colour, approaching to a purple hue; the integuments of the eye are dark; the conjunctiva injected; the tongue brown and quite dry; the lips and teeth sordid; respiration oppressed; occasional cough; pulse from 130 to 140; small and thrilling; skin, especially over the scalp, hot; tenderness of abdomen on full pressure.

4th. Cerebral symptoms the same; cough frequent, difficult; respiration short and hurried; pupils dilated, not contracting on exposure to light; conjunctiva injected; pulse small, hurried, irregular; all the stools passed in bed; pressure over the abdomen induces cough and apparently excites pain. Died in the evening. See pathology.

III. Typhus Mitior, with Abdominal Affection.

To the account of abdominal affection in typhus, it is necessary to add nothing to that already given of abdominal affection in synochus, excepting that, in the former, pain in the abdomen is scarcely ever felt; tenderness on pressure is less acute, and it is more common for both to be absent. On the other hand, the abdomen is more often swollen, hard, tense and tympanitic, while the stools are more early and more constantly passed involuntarily. It is in this type of fever, also, that hæmorrhage from the bowels most frequently takes place—an event not very uncommon in the severest and the most protracted examples of the disease. The tongue, also, is less constantly red than in the abdominal affection of synochus; but it is more uniformly dry, black and cracked.

Since the full exposition of pathology requires that many examples of this affection should be detailed under that head, and since, however numerous and striking such examples may be, they can illustrate no characteristic symptom beyond what has been already stated, it is unnecessary to cite any cases of it here.

IV. Typhus Mitior, with Mixed Affection.

Whenever the brain, the lungs, and the intestines become simultaneously and prominently affected in typhus, the case no longer assumes the mild, but lapses into the severer form. We shall, therefore, speak of this complication under—

II. Typhus Gravior.

The typhus gravior of authors is extinct; at least I have seen no example of it in London. I have witnessed nothing bearing a tolerable resemblance to this disease, even as it is depicted by Cullen, much less as it is portrayed in the darkly vivid, yet apparently but too faithful colouring of Huxam. This malady seems to have disappeared with the epidemic intermittents and the epidemic dysenteries of the good old times. Whatever there may have been in the condition of our ancestors to excite our envy, there is certainly nothing to provoke it in their diseases.

All the examples of fever which approach in likeness to the descriptions on record of typhus gravior which I have seen, have consisted of the mixed cases of typhus. They have been cases in which the brain, the lungs, and the intestines were all simultaneously and intensely affected. The symptoms may not al-

ways denote an *equal* degree of affection in all these organs; but I have never seen a case in which there were not the most unequivocal signs of intense affection in all of them. For the reason already assigned, such cases must necessarily be the severest that can occur, because the patient may be said to have three diseases instead of one to contend with, each of which alone is sufficient to destroy life, and each of which alone frequently does destroy it.

All the examples of this form of fever which I have observed are referrible to two classes; one in which the arterial action is excessive; the other in which it is oppressed, or rather overwhelmed.

1. In the first, the patient lies insensible, with delirium, perhaps so violent that he cannot be kept in bed without restraint; with extreme restlessness and constant watchfulness; with rapid and panting respiration; with a tender abdomen, perhaps with frequent and involuntary stools, a dry, black, and hard tongue, a quick, yet weak pulse, and the skin universally and pungently hot.

2. In the second he lies insensible, with a cold and dusky skin; with a swollen and livid countenance; with a heavy and oppressed respiration; with a pulse perhaps not to be felt, or, if distinguishable, either so rapid that it cannot be counted, so small that it is like a thread beneath the finger, and so weak that it is lost by the slightest pressure, or else slow, irregular, and intermittent. In this state, the

patient is almost as completely paralyzed as in apoplexy, and the attack is almost as rapidly fatal as apoplexy. It constitutes what has been called congestive fever.

Fortunately, these intense forms of the disease are of rare occurrence: they are witnessed only in solitary instances, and they arise either from exposure to a highly-concentrated poison, or from some condition of the constitution, by which that power to resist the influence of noxious agents, which is characteristic of life, is more than commonly diminished or exhausted. They have been conceived to form exquisite specimens of diseases of debility. But where is the debility? Not in the disease, for that is of giant strength; not in the patient, for remove, if you can but remove, a part of the load that oppresses him, and instantly an intensity of action will be set up in the whole system, perhaps as great as it is capable of exerting, and certainly greater than it is capable of sustaining without the most imminent danger. The brain is overwhelmed by the intensity of its affection; the energy that should animate the system, and of which it is the great source, is withheld: but that energy is suspended, not destroyed; and the debility which seems to be the result is not real, but apparent, not direct, but indirect. The giant that lies prostrate on the earth, mastered by superior power, has still a giant's strength, though he do not at that moment put it forth: give him but

the chance of throwing off the load that keeps him down, and he will soon show you that he is not weak. I have always been struck with the extraordinary clearness and decision with which the acuteness of Sydenham enabled him to make this important distinction, perhaps in the very first case that occurred to him, in which the discrimination was required. Having described, in his own powerful manner, an excellent specimen of congestive fever to which he was called, he states that he ordered the patient to be bled: that the bye-standers regarded the suggestion with horror: that the man seemed at the point of death; that to them it appeared that the abstraction of blood must inevitably extinguish the last remaining spark of life; while to him it was manifest that the patient was in this alarming condition, because he was oppressed by an overwhelming load, and if that could only be lessened, his condition would be the very reverse of what it now seemed: that accordingly, on the removal of some ounces of blood, the state of oppression ceased at once, and fever arose of a true inflammatory nature, for the subdual of which repeated bleedings were required.

It is remarkable, and it is highly characteristic of these intense forms of disease, that their pathology exhibits a striking contrast to that of the less severe affections. No morbid appearances are visible in the organs which seem capable of accounting for

death. There are signs of vascularity; the vessels are turgid with blood, and consequently the organs on which they are spent are in a state of congestion. But they seldom if ever exhibit any real appearance of inflammation, and still less do they contain any true inflammatory product. Why? Not on account of debility; but because the force of the disease is so great as to overwhelm the powers of life at the first onset, allowing even of no reaction, and much less of that continued excitement which is part and parcel of the inflammatory state, and which is indispensable to an inflammatory product. Reduce the intensity of the disease a little, bring it just within the limit that is compatible with the continuance of life for a given time, and then the products of inflammation at once appear in the greatest possible purity, variety, and extent.

And this is precisely the fact, as is demonstrated by the condition of the organs, in those ordinary types of fever, the essence of which has been supposed to consist in debility, and which have recently assumed the dignified name of adynamic. That men who are capable of looking only at the most obvious appearances of things, who, satisfied with what they find at the surface, give themselves no concern to discover its source, should continue to mistake the effect for the cause, and to consider as in its own primary and essential nature, that to be debility which is the last result of long-continued

and most destructive energy of action, is highly probable; but, on that very account, the fallacy is the more deeply to be deplored; because to these men must sometimes be committed the care of human beings who will fall certain victims to the error. It is easy to disregard the voice of reason when opposed to specious, however fallacious appearances; but it is difficult to withstand the evidence of sense. In justfication of the strength of the language I use, I therefore appeal to the pathology I adduce. The notion of debility in the intense forms of fever I look upon to be an error no less palpable in its nature than destructive in its consequences; and if the havoc it produces does not confer upon it a pre-eminence as bad as that of the very disease of which it is supposed to constitute the essence, it at least entitles it, in comparison with every other error in medicine, to the distinction recognised in society, between the hero and the murderer: the one destroys a single human being now and then; but the other numbers its victims by thousands. It may be difficult to eradicate this mischievous opinion where it was first engendered, and where it still continues to be fostered, in the study of the falsely reasoning theorist; but it is easy to confute it at the table of the pathological anatomist; and it must ultimately fall, if not by the pen, by the scalpel.

CHAPTER V.

Of Scarlatina. Characters by which it is distinguished from Continued Fever, without an Eruption. Division into Scarlatina Synochodes and Typhodes. Events which occasionally occur in Fever, but which form no essential Part of it.

THE only kind of continued fever attended with an eruption, which it falls within the compass of the present work to notice, is that of scarlatina, and, even in relation to this, after the full account which has been given of the other forms of fever, it will be necessary to state only the peculiarities by which it is distinguished.

1. The depression of the nervous system so characteristic of synochus and typhus, is much less in degree in scarlatina. Neither the physical nor the mental debility is as great. In the whole attitude and manner of the patient, as well as in his own sensations, there is less prostration. The disease is more nearly allied to a pure inflammatory affection than either of the preceding forms of fever.

2. Accordingly, the circulation is not only more rapid, but it is also more strong. It is not uncom-

mon for the pulse to be 140 in a minute; in severe cases it is seldom below 120. Without being hard, it is more full and strong and less easily compressed than in the other forms of fever.

3. Corresponding with the activity and energy of the circulation is the increase of the temperature; the heat over the whole surface of the body is often intense and pungent. In this fever, the temperature, as indicated by the thermometer, rises several degrees higher than in any other.

4. The capillary vessels of the external skin, as is shown by the bright and vivid colour of its characteristic eruption, are filled with blood. Often from the crown of the head to the sole of the foot, the external covering of the body is in a state of inflammation, and this inflammation constantly terminates in the death of the cuticle, whence it is thrown off by the process of desquamation. It is not improbable that the large quantity of blood which is thus spent upon the surface of the body, and which is thereby diverted from the internal organs, is one reason why the latter are not so much oppressed as in the other forms of fever.

5. Much as the external skin is loaded with blood, the capillary vessels of the internal skin appear to be equally turgid with it. This is indicated by the bright and vivid redness of the mucous membrane covering the mouth, the tongue, the fauces and the throat. That this redness extends beyond these ex-

ternal parts into the internal organs there is abundant evidence, because, although we cannot follow it with the eye, we can trace it by the signs of disordered function which arise.

6. Certain parts of the internal skin, as it covers particular organs, is peculiarly apt to pass into inflammation, and to terminate, like ordinary inflammation, in ulceration. The principal seats of inflammation are the throat and the larynx; but that, on the one hand, the inflammation extends from the throat into the stomach, is evident from the peculiar tenderness of the epigastrium, which is almost constant in scarlatina, and which is more acute than in ordinary fever; and that, on the other hand, it extends from the larynx into the bronchi and their ramifications, is evident from the symptoms of thoracic affection, which are at once more prominent and more constant than in the other forms of fever. The larynx, the cartilages of which are apt to be destroyed by ulceration, in the severe and mortal cases, is now and then attacked with a peculiar kind of laryngitis, to be further noticed in the pathology, which is almost uniformly and most rapidly fatal.

7. From the preceding observations, the new symptoms which are added to the febrile train in scarlatina, and which arise out of the modification of the fever by its complication with an inflammatory condition of the external and internal skin, are easily understood. They are the following: namely,

Scarlet eruption on the skin; vivid and peculiar redness of the mouth, tongue, fauces and throat: the presence of the disease may usually be discovered by this peculiar and specific redness of the tongue and throat alone, although every other characteristic symptom were absent: pain in the throat, difficult deglutition, huskiness and hoarseness of the voice. To these must be added other symptoms, which, though they are sometimes present in ordinary fever, are both more constant and more severe in scarlatina than in the latter, namely, pain in the chest, cough, difficult and hurried respiration, duskiness, in severe cases lividness of the cheek, often, especially in the commencement of the attack, nausea and vomiting.

Such are the chief peculiarities by which scarlet fever is distinguished: in all other respects the condition of the organs, and the symptoms which denote their disordered state are the same as in continued fever without an eruption.

Scarlatina occurs under two forms.—1st, With the symptoms common to synochus, (scarlatina synochodes) a form which, however severe the symptoms, if properly treated, rarely proves fatal. In general, it is a trifling malady, and, when severe, its chief danger consists in its tendency to pass into the second form, if it be neglected, or if it be badly treated. Under the most formidable aspect it ever presents, if the active treatment, which, when the symptoms are severe, ought always to be employed,

be resorted to with promptness and decision, in more than ninety cases out of a hundred, those symptoms are certainly and effectually subdued, and the disease, although it may not be cut short at once, is at once rendered mild and safe.

2. The second form of the disease (scarlatina typhodes) presents a striking contrast to the first: it is one of the most highly dangerous diseases which the practitioner in this country is ever called to witness. It is invariably attended with the symptoms which have been described as proper to typhus gravior. And these symptoms may consist either of those which belong to the first form of typhus gravior, and which have been already described,* or they may be those which characterize the second, or the congestive form.† The former is the most frequent, but the latter is not uncommon. The most exquisite specimens of congestive fever which it has happened to me to witness, have been those afforded by scarlatina: and there is no disease incident to this climate which is more alarming, more beyond the reach of remedies, or more rapidly fatal. Though fortunately several years may sometimes elapse without the occurrence of a single case of it, yet occasionally seasons return in which many cases happen. I have witnessed two such seasons in London, and all the persons I remember to have

* See page 175, 1. † See page 175, 2.

seen affected with it were near the age of puberty and not beyond that of thirty. For examples of it the reader is referred to the pathology.

Before bringing to a close this account of the general phenomena of fever, it is necessary briefly to notice some events which, because they occasionally occur in the progress of the disease, but are not constant, may be considered as accidental.

1. It is not very common, but there sometimes takes place an extreme degree of tenderness over the entire surface of the body. The sensibility is so much increased that the patient cannot bear, without pain, the slightest pressure. Several cases have occurred in which the entire skin was as tender to the touch as the abdomen in some of the abdominal cases. Whenever this preternatural sensibility occurs, it is always in connexion with an exceedingly severe form of the disease.

2. One of the most common occurrences in severe and protracted cases is excoriation of the skin, and the subsequent formation of a sloughing sore. In bad and long-continued cases of fever the powers of life are so much exhausted, and the sources of nourishment are so completely vitiated, that the skin and the subjacent parts have not vitality sufficient to bear even the pressure occasioned by the weight of the body. The most common seats of these sores

are the back, the sacrum, and the hips. They often spread far and eat deep; they are additional sources of irritation and exhaustion to a frame already reduced to the last extremity of feebleness, and the scale which seemed to be equally balanced between life and death, they often turn on the side of death.

3. In severe and protracted cases, and often coming to destroy the hope that was beginning to spring up in favour of the patient, erysipelas is no unusual visitant. It is the outward and visible sign of inward and always most formidable disease. Many and many are the persons it destroys who, but for it, would ultimately gain the victory over a malady with which they have carried on a doubtful contest, perhaps for fourteen or for one and twenty days.

4. Pain, swelling, hardness and suppuration of the glands in different parts of the body are not uncommon. The gland which most commonly suffers is the parotid, although the submaxillary, the axillary, and even the inguinal, are occasionally involved. These glandular affections never take place but in formidable cases, and their occurrence sometimes changes at once the entire character of the disease, and destroys the slightest hope of recovery.

5. Now and then there take place severe pain in the joints, together with tumefaction and excessive tenderness on pressure. These events usually come on towards the close of exceedingly bad cases, and they are often attended with very acute suffering.

Neither the occurrence of the events nor the appearances presented on examination after death, have hitherto been noticed, as far as I am aware, by any author. Every case attended with this peculiar affection that I have seen, has proved rapidly fatal. The condition of the joints, as ascertained by dissection, will be stated in the pathology.

Purulent discharge from the ears, deafness, spasmodic contraction of the extremities, convulsions, all depend upon certain states of the brain, and will be noticed when these states are spoken of. Numerous maladies arising from various degrees and complications of disease in the lungs, heart, pleura, viscera of the abdomen and investing membrane, not belonging to fever, but adding to its evils, are found on examination after death, which often fully account for anomalous symptoms that aggravated the case during life. Of these mention will be made in the proper place.

CHAPTER VI.

OF THE PATHOLOGY OF FEVER.

Importance of connecting the Symptoms with the States of the Organs: Pathology of Fever comprehends the Morbid Changes that take place in the Solids and Fluids of the Body. 1. *General Pathology of the Solids, exhibiting a collective View of the Morbid Appearances in the Head, Thorax, and Abdomen. Cases illustrating such Morbid Appearances in each of these Cavities.* 2. *Pathology of the Fluids.*

The preceding history of the symptoms of fever can be of no real use unless it be possible to connect it with the events of which those symptoms are the signs. The events consist of certain morbid changes which take place in the series of organs already enumerated. We arrive at the knowledge of these events first by noting the symptoms which occur during life, and their order of succession: and, secondly, by examining the condition of the organs after death in the fatal cases: a comparison of the symptoms, as previously observed, with the state of

the organs as subsequently ascertained, teaches us what the symptoms indicate. By carefully observing the symptoms in a large number of cases, we at length become acquainted with all the important symptoms that arise: by carefully examining the organs after death in a large number of cases, we gradually learn all the important changes in structure which they undergo: and by comparing, in all cases, the morbid symptoms with the altered states, we acquire in the end the power of ascertaining, with a high degree of probability, the presence of an event which we cannot see, by the presence of its sign which we can see.

In proportion as our knowledge becomes perfect, we are thus enabled, during life, and at the bed-side of the patient, to see what is going on within his brain, within his lungs, and within his intestines, with as much distinctness and certainty as we could were the cases in which these organs are enclosed, and the organs themselves transparent. The highly interesting and important fact demonstrated by the examination, in the manner of which we have just spoken, of large numbers of fever patients is, that the changes which take place in the organs are uniform: that the symptoms by which these changes are denoted are likewise uniform, and therefore, that it is possible to arrive at a perfect knowledge of the phenomena of fever.

The present state of our knowledge, it must be

confessed, is far from being perfect. To a certain extent, however, it is even already sufficiently perfect to afford the physician an invaluable guide in the conduct of his practice; and the steps that are wanting to complete the knowledge we possess (as far as human knowledge can be complete) future labour and perseverance will assuredly supply.

The pathology of fever comprehends the morbid changes that take place in the solids and the fluids of the body. It is probable that the changes in the fluids are wholly dependent upon those which take place in the solids, although the vitiation of the former must necessarily react upon, and increase the derangement of the latter. If it be true, as is highly probable, that the changes in the solids are beyond all comparison of the greatest importance, as not only antecedents, but *invariable* antecedents, or causes, it may be considered fortunate that our knowledge of their diseases is so much more advanced than our knowledge of the diseases of the humours. The morbid changes of the solids are ascertained with a great degree of exactness, it may almost be said with a great degree of perfection; while those which occur in the fluids are almost wholly unknown. Until very recently physicians satisfied themselves with framing conjectures about their corruption; and knowing with certainty no one vice that they possess, they attributed to them a thousand. Attention is now awakened to the sub-

ject: investigation is going on: and before long we shall probably know, with some degree of precision, whether any changes really take place, and what they are: but the researches which have hitherto been made are so few and so imperfect, that it can hardly be said that a single point is satisfactorily made out and firmly established.

In laying before the reader the pathology of the solids, as far as it is yet ascertained, it is my most anxious wish to enable him constantly to make for himself, as he proceeds, the association between the morbid appearances that are found after death, and the symptoms that were present during life. For this reason every case that is adduced to illustrate any morbid change is preceded by a brief account of the symptoms that were observed, day by day, at the bed-side of the patient. For the sake of brevity however, no less than for that of clearness, none but the essential are noticed. The daily reports, of which all the cases cited are exceedingly condensed forms, are full, and contain, as they necessarily must contain, many repetitions with which it would be worse than useless to burthen this account of them. Even the statement of the remedies that were adopted (excepting in as far as they obviously influenced the symptoms) is omitted, from the conviction that the mind cannot attend without distraction, at one and the same time, to the pathology and the treatment.

Predominance of affection is the principle according to which the cases are arranged, those in which the brain was most affected being classed together under one section—the cerebral; those in which the lungs were most affected under a second—the thoracic; and those in which the intestines were most affected under a third—the abdominal. In like manner, the individual cases under each section are so placed as to succeed each other, as nearly as possible, in the order of their severity.

Before entering into particular details, it may be useful to exhibit a brief outline of the general pathology of fever, showing, at one view, the general results which are derived from an examination of the collective cases. In this outline the organs in each cavity are noticed in the order of the frequency and extent in which they are found diseased.

I. Pathology of the Solids in Fever.

1. *External Appearances of the Body after Death.*

The skin is always of a more dusky colour than natural; it is sometimes studded with petechiæ, which in bad cases are large and of a deep purple tint, giving to the body a spotted or speckled appearance.

Externally the body always appears emaciated, and on removing the skin, the greater portion of the

adipose substance is found to be absorbed; what remains of it is of an unhealthy yellow colour. The muscular fibre is remarkably dark, and this dark colour extends, as we shall see immediately, to the internal viscera.

2. *Morbid Appearances in the Head.*

Of the membranes of the brain, the arachnoid is the most constantly diseased. It is seldom or never in a healthy condition. It is always either more vascular than natural, or when in this respect unchanged, it is altered in structure, being thickened, opake and milky: when in this latter state, a gelatinous fluid is usually effused beneath it. Not uncommonly, it is united at several points to the membranes above and below it. To the dura mater it very often adheres, particularly at the angles of the hemispheres, or along the course of the longitudinal sinus; and, in these cases, the adhesion is always peculiarly firm at the vertex. The dura mater itself is less constantly changed in appearance, although this membrane also is sometimes more vascular than natural, and frequently it either adheres with preternatural firmness to the skull-cap, or, on the contrary, it is quite detached from it, in consequence of effusion between it and the bones of the cranium. To the pia mater, the arachnoid is also very often adherent at several points: it is seldom that the pia mater is changed in structure, but it is generally

preternaturally vascular. In like manner, the theca which encloses the spinal cord is frequently highly vascular, and contains a larger quantity of fluid than natural.

The brain itself is seldom or never in a healthy condition; the morbid changes to be distinguished in it differ greatly in degree in different cases, but still, in almost every case, some morbid change is to be discerned. These changes consist of an altered state of its substance, or of its cavities, or of both. The most usual change apparent in its substance is a higher degree of vascularity than natural. This increased vascularity is sometimes confined to the surface; sometimes it is more manifest deep in its substance; and, while common to both, it may exhibit different degrees of intensity in either. When on the surface, this preternatural vascularity is denoted by a greater fulness of the vessels, and, apparently by an increase in their number; when within the substance, by a greater number of bloody points, which are rendered visible by an incision with the scalpel. And in both situations it may exist in all degrees, from a faint blush to a deep and vivid redness. The substance itself is sometimes softer, sometimes firmer than natural. The softening differs in degree and in extent. Sometimes the entire cerebrum is manifestly and considerably softer than natural; at other times, only particular portions of it are found in this softened state. Now and then,

but very rarely, abscess is discovered within its substance. It is remarkable that the cerebellum is always considerably softer than the cerebrum: whence these two portions of the organ are often observed to be in opposite states, the cerebrum being frequently preternaturally firm, and the cerebellum being almost always softer than natural. The pituitary gland also is very constantly softened, and often in a state of suppuration. When the cerebrum is preternaturally firm, the firmness is usually general.

The morbid change observable in the cavities of the brain consists in their containing an excess of secretion. This increase of secreted fluid is usually accumulated in the lateral ventricles: the quantity varies from a drachm to several ounces; when thus great, the lateral ventricles themselves are enlarged, the third and fourth ventricles are likewise distended with fluid, and the passages connecting them are proportionally full.

Common as it is to find a preternatural quantity of fluid in the ventricles, it is still more common to find it in excess between the membranes; often between the dura mater and the arachnoid, almost always between the arachnoid and the pia mater. It has been already stated, that the fluid effused between the arachnoid is of a gelatinous appearance and aspect; every where else it possesses the physical properties of serum, being thin, transparent, and of a straw colour: now and then it is thicker in

consistence, opake, and even bloody, and sometimes that beneath the membranes contains flakes of lymph, or is mixed with pus.

It is observable that the two morbid conditions now described, that of excessive vascularity and that of increased secretion, are never co-existent. If the vessels of the brain and its membranes are loaded with blood, there is little or no fluid within the former or between the latter: if, on the contrary, the effusion be great, there is little or no appearance of vascularity. Effusion is the effect and the termination of vascularity; it is the ultimate result of vascular action, and the effect having ensued, the cause ceases to be apparent.

The substance of the spinal cord is seldom changed, either in vascularity or in consistence: the morbid changes which this organ undergoes have hitherto been observed only in the membrane that invests it, which, as has been just stated, is not only highly vascular, but likewise contains a much larger quantity of fluid than natural.

3. *Morbid Appearances in the Thorax.*

Of all the thoracic viscera, that which is most frequently diseased is the mucous membrane of the bronchi. The disease which takes place in this organ is not only the most constant, whatever be the type or the degree of fever, but it is also the most characteristic of the febrile state. Its disease is specific and

uniform. It consists of preternatural redness. The character of this redness distinguishes it from that which is observed in ordinary inflammation. It is uniformly and strikingly darker, the difference in colour being precisely that which subsists between venous and arterial blood. This darkness of colour apparent in the bronchial lining, increases in degree as the tubes of the bronchi diminish in size: while it may be only just discernible in the large trunks, the colour may be nearly black in the minute branches. This change in the natural colour of the membrane is indicative, not only of an increase in its vascularity, but of alteration in its structure. It is almost always attended with a preternatural thickening of its substance, as is demonstrated by cutting through the tube and reflecting the membrane. The tubes themselves contain more or less fluid, which consists of mucus, mixed with pus. Analogous to what has been stated with regard to the vascularity of the brain and to its secretions, when the quantity of secretion contained in the bronchial tubes is great, the degree of vascularity apparent in the membrane is lessened.

In scarlet fever, the morbid changes are somewhat different. The mucous membrane covering the trachea, the larynx with its cartilages, the amygdalæ and the soft palate is inflamed; the redness is of a brighter and more vivid colour than that which has been stated to be characteristic of continued fever

without an eruption: it is similar to the characteristic colour of the scarlatina tongue. But what is very remarkable, and what appears to justify the view we have taken of scarlatina and the division we have suggested of its types, when the cases are severe, the colour of the mucous membrane becomes much darker, the deepness of the tinge increasing with the severity of the affection, until, at length, the colour closely resembles that which is peculiar to ordinary fever.

As in continued fever without an eruption, so in scarlatina, the increased vascularity of the mucous membrane is accompanied with a preternatural thickening of its substance. In scarlet fever, that portion of it which covers the epiglottis, the rima glottidis, and the arytænoid cartilages, is especially found in this diseased condition. When this inflammation and thickening passes into the state of ulceration, which it often does, the arytænoid cartilages are the special seat of this process, although the ulceration often extends to the amygdalæ, and sometimes to the root of the tongue.

When in every other respect healthy, the substance of the lungs in fever is so constantly found either engorged with blood or infiltrated with serum, that these changes would seem to form essential parts of the morbid phenomena.

In examining those who die of fever, a great variety and complication of thoracic diseases, in addition

to the morbid changes just described, are found. The pleuræ exhibit every degree of vascularity, from the faintest blush of redness to that which is characteristic of the most intense inflammation, and every extent of adhesion, from that of the smallest point to the complete obliteration of the cavity. The usual products of inflammation, namely, the effusion of serum and lymph, and the formation of pus and of adventitious membrane are likewise found equally varying in degree. The parenchyma of the lungs, besides the engorgement and infiltration just adverted to, presents hepatization and tubercular disease in every variety and degree; ulceration and abscess in every extent, and hæmorrhagic and calcareous depositions, together with enlargement and melanosis of the bronchial glands. But, since none of these diseases form any part of the changes of structure which are peculiar to the febrile state, it is sufficient in this place merely to advert to them.

4. *Morbid Appearances in the Abdomen.*

On opening the cavity of the abdomen all the viscera contained in it appear, in general, more vascular than natural, and invariably of a darker colour than in the state of health. Several of the organs are affected in a uniform and peculiar manner, but that which is by far the most constantly diseased is the mucous membrane of the small in-

testines; and especially that portion of it which lines the ileum and the cæcum.

The varieties of disease exhibited by this membrane may be comprehended under three, namely, vascularity, thickening and ulceration.

In all cases increased vascularity is the first stage of disease: in a great proportion of cases this increased vascularity is confined to the inferior extremity of the small intestines, which is often distinctly inflamed when not the slightest deviation from healthy structure is traceable in any other part of the canal.

The second stage of disease consists in thickening of the membrane, or in deposition of matter beneath it, or in both. Preternatural thickening of the membrane is often of very considerable extent: deposition of matter beneath it appears to be confined to the situations of the mucous glands. These glands are found in all states and stages of disease from the least to the greatest enlargement, and from the mere abrasion of their surface to the entire ulceration of their substance. Perhaps one of the glandulæ solitariæ enlarged and covered with inflamed mucous membrane may constitute the only morbid appearance discernible in the intestine; or this deposition may take place in so many of these glands as to present a most extensive surface of disease.

The third stage is that of ulceration, which may

supervene when the membrane is affected in either of the modes just described; but the ulcer will not be the same in both cases: in each it will have a different and a distinctive character. If ulceration take place while the mucous coat is in a state of simple vascularity, the ulcer will in general be extensive but superficial; its surface will present a smooth appearance, and its margin will be regular and defined: if, on the contrary, it occur after thickening of the membrane or enlargement of its glands, its characters will be just the reverse: it will be less extensive, but more deep, because it must penetrate a mass of adventitious matter before it can reach the other coats; and, for the same reason, its margin will be more elevated and its surface more ragged. It is in this form of ulcer that perforation of the intestine generally occurs; in which case the mucous and muscular coats alone are ulcerated: the peritoneal gives way from gangrene.

Whenever the mucous membrane is ulcerated, whatever be the form of the ulcer, the corresponding portion of the peritoneal coat is more vascular than natural; and perforation must be attended with inevitable death, on account of the extensive and intense peritonitis excited by the escape of fæces into the peritoneal cavity.

Frequent as ulceration of the mucous membrane is in fever, and characteristic as this lesion is of the febrile state, yet it sometimes appears to be present

when it does not really exist. From the quantity of adventitious matter deposited beneath the mucous coat, its surface sometimes becomes irregularly elevated, its valvulæ conniventes obliterated and its aspect smooth and glistening: in this state it may be easily mistaken, on a superficial examination, for ulceration, while more careful observation will show that the membrane itself remains entire.

Proportioned to the extent and degree of these changes in the intestine are, inflammation, enlargement, induration and suppuration of the mesenteric glands; and invariably those glands which are embedded in that portion of the mesentery attached to the affected intestine, are the most diseased.

It is quite remarkable with what uniformity the spleen is diseased in fever. In almost every case of genuine fever hitherto examined, it has been found altered in appearance and deranged in structure. Its natural purple colour is changed to a deeper and darker tint, and, on the removal of the peritoneum that invests it, its substance, on being slightly touched with the finger, breaks down into an almost fluid mass.

The pancreas, the structure of which is so seldom changed in any other disease, is very constantly deranged in fever. Its morbid condition is invariably the same, and, what is singular, it is exactly the reverse of that produced in the spleen. It is always more firm than natural; often it is exceedingly in-

durated, and that portion of it which is attached to the duodenum is sometimes nearly cartilaginous.

Each organ having been described in the order of the frequency and extent of the disease it exhibits, we have hitherto said nothing of the mucous membrane of the stomach. This viscus having been regarded in France as the great source and seat of fever, particular attention has been paid to the appearances it exhibits after death. The uniform result of the most careful examination of fatal cases in London is, that the mucous membrane of this organ is less frequently, less severely, and less extensively diseased than any other portion of the same membrane. Occasionally it is more vascular than natural; this vascularity is seldom general; it is almost always confined to its pyloric half; in the few cases in which it has been very great, the membrane has been observed to be thickened and sometimes softened: but no instance has occurred in which it has been the seat of a single ulcer.

Of all the abdominal viscera, the liver is the least frequently deranged in structure, and when it exhibits any morbid change it is both less extensive and less characteristic. The blood contained in it is peculiarly dark and always fluid; its parenchyma is sometimes softer than natural; the gall-bladder contains a large quantity of bile, which is seldom healthy, being almost always in one of two states of disease,

either paler and more fluid than natural, or extremely dark and very much inspissated.

The preceding comprehend all the morbid conditions of the abdominal viscera which are peculiar to fever: but the organs of this cavity exhibit other and great varieties of disease, to which, since they form no part of the febrile changes, it is sufficient merely to advert. Such are inflammation of the peritoneum; effusion of lymph upon its surface or of serum into its cavity; agglutination of the intestines; inflammation of the mesentery; false adhesions between the liver, spleen, and mesentery; tubercles in the liver; induration of its substance; tubercles and abscess of the spleen; thickening of the coats of the bladder and inflammation of its mucous membrane: in the female, vascularity and enlargement of the ovaria, to which hydatids are sometimes attached; vascularity of the external surface of the uterus, and inflammation of the os tincæ and of its internal membrane: it is rare to find any appearance of disease in the kidney in either sex.

Such is the circle of organs which are observed to be specifically diseased in fever, and with the most remarkable constancy. We go on to give individual cases in illustration of these morbid changes and of the symptoms with which they are accompanied.

I. Cases in illustration of the Morbid Changes which take place within the Head: or Cerebral Cases.

1. *Vascularity of Brain, Spinal Cord and Membranes, with Gelatinous or slight Serous Effusion.*

Case XV.

Sarah Agenbar, æt. 21, married.

After some previous indisposition, attacked, eight days ago, with the ordinary symptoms of fever. At present, unable to give any account of her illness, or to answer any question: delirium came on four days ago, which still continues; mind quite fatuous; extreme restlessness; no sleep: eyes wild and rolling; tongue not to be protruded; pulse 130, weak and indistinct.

9th. No sleep; delirium the same; pulse 126.

10th. Died.

Head. Membranes and substance of the brain highly vascular; no effusion. *Thorax.* Viscera exhibited only slight indications of disease. *Abdomen.* Viscera nearly healthy.

Case XVI.

Mary Welsh, æt. 55, admitted on the 15th day

of fever. Attack came on with ordinary symptoms. Pain of head now gone; some sleep; tongue loaded, moist; pulse 80; skin cool.

21st. No pain; much prostration; tongue dry; pulse 104.

22d. Stupor; mind incoherent; scarcely any sleep; tongue brown and dry; pulse 108; skin hot.

27th. Coma; erysipelas on face; pulse 110.

28th. Coma increased; tongue deeply crusted; erysipelas extending.

29th. Delirium; tongue black; stools passed in bed; erysipelas extending.

30th. Muscular tremor.

35th. Increasing coma and prostration. Died.

Head. Arachnoid opake; slight serous effusion; substance of brain and spinal cord vascular. *Thorax.* *[Ten or twelve ounces of serum in bag of pleuræ; pericardium contained twelve ounces of sero-purulent fluid; that part of it which is reflected over the heart highly inflamed and covered with flakes of coagulable lymph.] *Abdomen.* Viscera healthy.

Case XVII.

Margaret Gibbs, æt. 63, widow, admitted on the 43d day of fever. Pain of head still consi-

* Those morbid appearances which, not being constant in fever, must be considered as accidental, are placed in brackets throughout this chapter.

derable; sleeps badly; pain of chest on right side; much cough, with purulent expectoration; abdomen tender; tongue loaded, dry; pulse 105.

45th. Pain gone; drowsiness, approaching to coma; no delirium; pulse 100.

48th. Insensibilitiy continues; cough, with bloody sputa; pulse 108.

55th. Prostration; pulse 135, extremely weak; skin cold and clammy.

57th. Died.

Head. Arachnoid opake, with gelatinous effusion beneath it; adherent to the dura mater along the longitudinal sinus; substance of brain vascular. *Thorax.* [Pleuræ adherent; slight effusion in left side; substance of lower lobes partly gorged, partly hepatized; melanotic deposits in the parenchyma. *Abdomen.* Both ovaria dropsical; partly converted into cartilage; scirrhous tumour in walls of uterus.]

Case XVIII.

Elizabeth Ralph, æt. 65, widow, admitted on the 8th day of fever. From commencement, severe pain of head and abdomen; both continue; mind confused; scarcely any sleep; tongue foul and dry; much thirst; bowels purged; pulse 105.

9th. Pain of head diminished; that of abdomen unrelieved; 8 stools; pulse 108.

10th. Pain of head gone; that of abdomen undiminished; 4 stools.

11th. Pain of head not returned; tenderness of abdomen undiminished; 7 stools; pulse 124.

12th. Tenderness of abdomen unabated; now swollen, hard, and rounded at umbilicus; 7 stools; pulse 125.

14th. Tenderness and purging continue. Died.

Head. [Falciform process of dura mater ossified;] substance of brain vascular; more fluid than natural in the ventricals. *Thorax.* [Pleuræ adherent; serous effusion into parenchyma of lungs. *Abdomen.* Peritoneal sac contained several ounces of pus and serum; peritoneum covering the liver coated with coagulable lymph; peritoneal coat of the intestines highly inflamed; colon adherent to the omentum all around;] all its coats so softened as to be easily torn; mucous membrane in general healthy.

Case XIX.

Elizabeth Gasset, æt. 32, married, admitted on the 8th day of fever. Attack commenced, in addition to the common symptoms, with violent pain of the bowels. Epigastre still extremely tender; tongue red, clean, moist; no stool for six days; no pain of head or chest; pulse 99.

9th. Tenderness of epigastrium continues; tongue

red and dry; no stool; pulse 84; no cerebral nor pectoral symptoms.

10th. Died.

Head. Membranes and substance of the brain highly vascular; no effusion. *Thorax.* Viscera healthy. *Abdomen.* [Eight inches of the jejunum intussuscepted within a portion of the same intestine of equal length; the farthest extremity of the intussuscepted part mortified; the mucous membrane of the containing portion highly vascular and in a state of ecchymosis; the intestinal canal, between the constricted portion and the stomach, contracted, and its valvulæ conniventes enlarged and œdematous: the size of the tube beyond the disease much diminished, and the colon, especially, contracted into a mere cord.]

Case XX.

Joseph Danbury, æt. 20, stone-cutter. Admitted on the 15th day of fever; pain of head, which has never been great, is now very slight; much vertigo; eyes sallow; no uneasiness in chest; some cough; abdomen tender; tongue brown; teeth sordid; much thirst; pulse 108.

26th. Since last report, pain of head never entirely absent; vertigo constant and distressing; pain in the right side of the head much increased to-day, while

the vertigo is now gone; delirium; eyes suffused; tongue dry; pulse 120.

36th. The pain of the head and the giddiness have continued to alternate; both are now quite gone; mind confused and dull; expression of countenance wild; muscular tremor; respiration hurried.

37th. Died.

Head. Pia mater vascular; substance of brain vascular; slight effusion between the membranes and into the ventricles. *Thorax.* No prominent disease. *Abdomen.* Peritoneal coat of intestines vascular; other viscera healthy.

Case XXI.

Eeward Forrester, æt. 46, cabinet-maker. Admitted on 6th day of fever. Complaint commenced with severe pain of back, loins, and epigastrium, with sense of ardent heat. At present, pain of head slight; that of epigastrium continues; tongue white, moist; no uneasiness of chest; pulse 90.

7th. Pain of head, limbs and epigastrium; tongue white, dry; pulse 96, full and strong. V.S. ad ℥xij.

8th. Pain of head gone; that of epigastrium diminished; pulse 110; blood not sizy.

10th. Pain of head returned; that of epigastrium diminished; no sleep; delirium; pulse 126.

12th. Pain of head again gone; delirium continues; pulse 110.

13th. No sleep; mind confused; delirium; subsultus tendinum.

15th. Cerebral symptoms undiminished; tongue dry and quite black; lips and teeth covered with black sordes.

19th. Severity of symptoms had diminished; lips, teeth, and tongue had begun to clean; pulse fallen to 96; but the parotid gland to-day painful, enlarged and indurated.

20th. Tumour of parotid increased; all the symptoms greatly aggravated; tongue not to be protruded.

22d. Insensibility amounting to coma.

27th. Insensibility and prostration gradually increased. Died.

Head. Arachnoid white and opake; firmly adherent along the vertex to the dura mater. Surface and substance of brain highly vascular; gelatinous effusion between the membranes. *Thorax.* Mucous membrane of bronchi vascular; [pleuræ adherent; lower lobe of left lung partly hepatized, and partly consisting of a mass of suppurating tubercles.] *Abdomen.* Small intestines of extremely dark colour; mucous membrane vascular.

Case XXII.

Mary Singleton, æt. 28, married. Admitted on the 8th day of fever: pain of head slight, confined chiefly to the occiput; pain of left side, with ina-

bility to lie on it; no cough; tenderness of abdomen; pulse 111.

9th. After venesection to twelve ounces pain in head, side, and abdomen relieved; blood buffy.

11th. Slight pain of occiput; much pain and tenderness of abdomen; pulse 120.

13th. Cerebral and abdominal symptoms unchanged; tongue brown and dry; eyes yellow.

19th. Pain of head never entirely disappeared, but though always present it was always slight; now respiration hurried: tongue extremely brown and dry; pulse 120; eyes yellow.

20th. Died.

Head. Membranes of brain vascular with gelatinous effusion beneath them; and slight serous effusion into ventricles: substance both of cerebrum and cerebellum highly vascular; pituitary gland softened and suppurating. *Thorax.* Mucous membrane of bronchi vascular; substance of both lungs gorged with blood; [pleuræ universally adherent.] *Abdomen.* Mucous membrane of intestines not vascular; but the mesentery highly injected: [liver adherent to diaphragm.]

Case XXIII.

Mary Ann Lamberth, æt. 16, servant. Admitted on 22d day of fever. Pain of head, which has been very severe, is now gone; no tenderness of abdomen

on fullest pressure; tongue red, smooth, and chapped; lips and teeth sordid; bowels purged; pulse 108.

30th. Cough with slight expectoration; cheek dusky; no tenderness of abdomen; bowels purged; pulse 120.

35th. Mind confused; much restlessness; no sleep; stools passed in bed; pulse 124, weak. A diffused swelling has appeared about the left wrist, attended with great pain.

36th. Mind more confused; countenance sunk; swelling of wrist increased; pulse not to be counted.

37th. Died.

N. B. Probable that the swelling of the wrist arose from the peculiar affection hereafter to be described.*

Head. Some effusion beneath the membranes, and at the base of the skull; substance of brain natural; anterior and middle lobes firmly adherent. *Thorax.* Healthy. *Abdomen.* The ilium contained one large and spreading ulcer, the glands around which were darkened and inflamed.

Case XXIV.

Mary Crouch, æt. 30. Admitted on the 7th day of fever. At present pain of head gone; some pain of back continues; no sleep; great restlessness;

* See Case L.

almost constant moaning; no uneasiness of chest; no cough; respiration hurried; pulse 108.

8th. Sleeplessness, hurried respiration, tenderness of abdomen continue; tongue red and glazed.

9th. Delirium; respiration hurried and noisy; lips and teeth sordid.

10th. Subsultus tendinum.

11th. Face livid; dark, bloody-coloured fluid issuing from the mouth; convulsive twitchings of muscles of face and hands. Died.

Head. Arachnoid opake; dura mater vascular; substance of brain vascular; some effusion between membranes and into ventricles. *Thorax.* Nearly healthy. *Abdomen.* Mucous membrane of ilium vascular; liver soft.

Case XXV.

Mary Goodman, æt. 50, nurse. Admitted on 4th day of disease: has been in a state of constant intoxication for several days past; has had much pain of head, which is now nearly gone; mind confused; eyes injected; abdomen tender; bowels purged; tongue brown and dry in middle: white at edges; tremulous; pulse 120; skin hot. Died next morning.

Head. Sinuses of dura mater turgid with blood; vessels of pia mater greatly congested; an ounce and a half of serum at the base of the skull. Theca

vertebralis highly vascular; great congestion of vertebral veins; some effusion of serum at cauda equina. *Thorax.* Healthy. *Abdomen.* Mucous membrane of small intestines vascular; [liver greatly enlarged.]

Case XXVI.

John Eyles, æt. 25, servant. Admitted on the 10th day of scarlet fever. Throat sore; deglutition painful; eruption fading; no pain of head, chest, or abdomen; tongue red and glazed; lips and teeth sordid; bowels purged; pulse 129.

11th. Voice hoarse; pulse 120; not the slightest pain of head.

14th. Numerous ash-coloured crusts scattered over the internal fauces; countenance anxious; respiration hurried; pulse 108. Died next morning.

Head. Arachnoid thick, opake, and unusually firm, with slight effusion beneath it; substance both of cerebrum and cerebellum highly vascular; pituitary gland enlarged and beginning to suppurate. *Thorax.* Larynx inflamed, covered with superficial circular ulcers; tongue aphthous; mouths of ducts on the surface of the amygdalæ ulcerated. *Abdomen.* Mucous membrane of ilium and cæcum highly vascular, not ulcerated; vessels of all the organs exceedingly turgid with blood.

2. *Vascularity of Brain, Membranes, &c. with Effusion of Coagulable Lymph and Formation of Pus.*

Case XXVII.

James Moulden, æt. 17, servant. Admitted on the 5th day of fever; left the hospital three months ago cured of a similar attack. Present relapse came on besides the ordinary symptoms, with severe pain of the head; pain still continues, but it is now only slight; expression of countenance dull and heavy; pulse 92, soft; no thoracic symptoms; no tenderness of abdomen; tongue loaded in middle with yellow fur, red around the edges, moist.

6th. Pain of head continues with sense of weight and intolerance of light; scarcely any sleep; pulse 102.

9th. Pain of head and intolerance of light increased; adnatæ glistening; pulse 94.

10th. Pain of head quite gone; sense of weight and intolerance of light continue; face flushed; pulse 84.

11th. Pain of head returned; no sleep; delirium; pulse 96; tongue brown and dry.

13th. Pain of head and dulness and heaviness of eyes increased; pulse 84; abdomen tender.

14th. Nearly insensible; pulse 90; abdomen tender, swollen, and hard.

15th. Last evening coma increased; respiration became hurried and laborious; great prostration; expired this morning.

Head. Membranes highly vascular; a large quantity of coagulable lymph effused at base of the brain. *Thorax.* Mucous membrane of bronchi highly vascular; substance of lungs gorged with blood. *Abdomen.* On mucous membrane of stomach several patches of a dark red colour; mucous membrane of intestines pretty natural. [Spleen studded with soft tubercles of various sizes, some of which contained a cheesy matter; others a puriform fluid; the liver contained a few tubercles of the same nature but smaller.]

Case XXVIII.

Charlotte Clarke, æt. 18, servant. Admitted on 3d day of scarlet fever; throat sore; deglutition painful; no pain of chest; some cough; pain of head severe; much pain of limbs; mind distinct; tolerable sleep; no tenderness of abdomen; skin warm, covered with scarlet eruption; tongue characteristic; much thirst; no stool for three days; pulse 126, of good power; V.S. ad ℥xvj.

4th. Blood inflamed; throat continues sore; pain of head gone; pulse 130. Hirud. xij. gutt.

5th. Throat unrelieved; deglutition very painful; no pain of head; pulse 110. Rep. Hirud. x.

6th. Throat nearly well; pulse 116.

16th. Had become convalescent; yesterday evening felt scarcely so well; during the night extremely restless, with much noisy delirium; at present quite prostrate; pulse 117, not weak; respiration hurried; abdomen tender; tongue quite dry; four stools of green colour, all passed in bed; erysipelas on right temple.

17th. Lies quite prostrate; insensible; constant delirium with unceasing moaning; muscular tremor; all the stools passed in bed; pulse 126. Died following morning.

Head. Dura mater vascular; some spots of ecchymosis between its laminæ; arachnoid vascular, with effusion of viscid serum between it and pia mater. Between the arachnoid and the pia mater covering the superior part of the right hemisphere a layer of coagulable lymph of a yellow colour, on the removal of which the pia mater beneath it appeared entire. Shreds of coagulable lymph were also found at the base of the brain where there was more serum than natural as well as in the ventricles. Substance of the brain highly vascular. Viscera of thorax and abdomen healthy.

Case XXIX.

Isaac Coombes, æt. 60, weaver. Admitted on 9th day of fever: at present no pain of head; some

sleep; face pallid; great prostration; no thoracic or abdominal symptoms.

15th. Convalescent.

21st. Attacked suddenly with shivering, heat, vomiting; no pain of head or of any organ; pulse 96.

22d. Continues quite free from pain, but no sleep; extreme restlessness; great prostration; skin warm and dry; pulse 84. Died following morning.

Head. Between the pia mater and the arachnoid a large quantity of coagulable lymph of a yellow colour, with which indeed the arachnoid appeared to be universally lined, and which in some places was very thick. Substance of the brain highly vascular, being exceedingly full of bloody points, and in some places stained; three or four ounces of serum in the ventricles, at the bottom of each of which lay about a drachm of pus. The spinal sheath contained the same kind of substance, while the cord itself presented a healthy appearance. *Thorax.* Right lung gorged with blood and partly hepatized. *Abdomen.* Spleen soft; other viscera healthy.

Case XXX.

Susannah Stammers, æt. 9, destitute. Admitted on the 8th day of fever. Attack commenced with severe pain of the head which continues with almost equal violence; little or no sleep; eyes dull and

heavy; face flushed; pulse 126; slight uneasiness of chest on full inspiration; no cough; no tenderness of abdomen; tongue loaded with white fur; red at point; bowels purged.

9th. Pain of head quite gone; less sensible; countenance more dull and heavy; pulse 120; abdomen tender.

11th. Delirium, with much talkativeness; pulse 112.

14th. Coma; bowels continue purged.

15th. Abdomen tender, swollen, rounded at navel.

19th. More sensible; more tranquil sleep; delirium gone; pulse 110.

27th. No coma nor delirium; tranquil sleep; tongue moist, cleaning; pulse 108, feeble.

45th. Appeared upon the whole to be convalescing, but in an exceedingly slow and imperfect manner; there was a remarkable vacancy in her countenance, almost amounting to a fatuous expression; and her mind was peevish and childish. On this day she was seized suddenly with convulsions of extreme violence, and died within twenty-four hours after the attack.

Head. Arachnoid thickened and opake; effusion of gelatinous fluid beneath it; substance of brain highly vascular; in the inferior cornu of left ventricle a pint of purulent matter, somewhat resembling broken down cortical substance; it lay loose within the cavity. *Thorax.* Superior lobe of right

lung gorged and partly hepatized. [Pleuræ of right side adherent.] *Abdomen.* Mucous membrane of cæcum and commencement of colon vascular.

Case XXXI.

Henry Brewer, æt. 59, labourer. Admitted on the 10th day of fever: states that he has no pain in the head, and that he is quite free from pain every where excepting in the right side, where he has some uneasiness, which is attended with slight cough; tongue brown and dry; bowels natural; pulse 96.

12th. No pain of head; that of chest gone; sleeps well; pulse 108.

16th. About an hour after yesterday's visit became suddenly insensible; it has been impossible to rouse him from this coma which still continues profound; respiration stertorous. Died in the course of the day.

Head. Dura mater thickened but not vascular; arachnoid thickened and opake; beneath it gelatinous effusion; upon its external surface a large quantity of well-formed puss; a quantity of purulent matter at the base of the brain surrounding the corpora quadrigemina: walls of the fourth ventricle ragged; two ounces of serous fluid in lateral ventricles and at base. *Thorax.* [Pluræ adherent; lower and middle lobes of right lung hepatized.] *Abdomen.* Viscera healthy.

3. *Vascularity of Brain, Membranes, &c. with copious Serous Effusion.*

Case XXXII.

George Blackbeard, æt. 18, servant. Admitted on the 22d day of fever; complaint commenced with violent head-ache attended with frequent fits of epistaxis; pain of the head still continues, chiefly confined to the occiput; little sleep; eyes injected and suffused; pulse 102, tongue loaded, dry.

23d. Scarcely any pain in the head.

25th. Pain of the head entirely gone; epistaxis.

26th. Delirium: muscular tremor.

28th. Delirium and muscular tremor increased; pulse 112; tongue more dry; lips and teeth sordid.

31st. Died.

Head. Membranes and substance of brain vascular; ventricles distended with serum; no characteristic disease in thorax or abdomen.

Case XXXIII.

Ann Higgins, æt. 30, servant. Admitted on the 22d day of fever: pain of head from the commencement very severe; chiefly confined to the right side; still continues, together with severe pain in the limbs; some pain in the right side of chest; cough; ab-

domen not tender; tongue dry in middle; red and moist around edges and at point; pulse 105, feeble; much prostration; entire surface of the body preternaturally sensible.

23d. The sensibility which from the commencement has been felt over the whole surface of the body is now particularly acute in the joints; in all of which there is severe pain; pulse 112.

25th. Pain of head gone; mind indistinct; tongue dry: stools passed in bed; pulse 105. Pains in the joints; swelling and redness of left fore-arm.

27th. Mind more and more indistinct; pressure on any part of the body produces extreme pain; joints the same; died next day. At this period attention had not been awakened to the peculiar disease of the joints hereafter to be described; they were not therefore examined; but without doubt the affection was of the same nature.

Head. Dura mater vascular, and adhered with preternatural firmness to the skull; pia mater vascular; substance of brain natural; pituitary gland suppurating; the lateral and the third ventricles full of serous fluid; one ounce at base. *Thorax.* [Lungs emphysematous; several points of tubercular suppuration in left.] *Abdomen.* Mucous membrane of small intestines inflamed without ulceration.

Case XXXIV.

James Dennie, æt. 28, labourer. Admitted on the 8th day of fever, which attacked with usual symptoms: at present pain of head; little sleep; eyes dull and heavy; some cough; respiration hurried; abdomen not tender; tongue white; pulse 112, weak; prostration.

9th. Pain of head increased; delirium; eyes suffused; cough and hurried respiration continue.

10th. Pain of head gone; constant and violent delirium; no sleep; pulse 108.

11th. Delirium gone; profound coma; muscular tremor; respiration hurried; pulse 108.

12th. Coma deeper; extreme restlessness; respiration more hurried; stools and urine passed in bed. Died.

Head. Arachnoid vascular; substance both of cerebrum and cerebellum vascular; all the ventricles full of serum; viscera of thorax and abdomen healthy.

Case XXXV.

Charlotte Watts, æt. 9. Previous history of disease unknown: at present scarcely at all sensible; almost constant crying; frequent rolling of the head on the pillow; countenance anxious; pulse not to be counted from her extreme restlessness; respiration

hurried; abdomen not tender; lips and teeth sordid. 2d day after admission constant noisy delirium; pulse 120.

17th. Almost imperceptible, but still gradual improvement since last report; more sensible; no delirium; but mind throughout extremely peevish and fretful; stools have constantly been and still are passed in bed; pulse 116.

19th. Large sloughing sores on loins and hips; erysipelas of surrounding integuments; pulse 112, weak.

27th. Sloughs have extended between the shoulders, along the back, and over both hips; great emaciation; extreme prostration; mind continues very fretful; pulse 110, very weak.

37th. Gradually grew weaker and weaker until this day, when she died.

Head. Arachnoid vascular; substance of brain and especially medulla oblongata highly vascular; between the arachnoid and the dura mater much limpid serum; all the ventricles distended with a similar fluid. *Thorax.* [Pleuræ adherent. Both lungs contained numerous tubercles in a state of suppuration. A large proportion of right lung hepatized.] *Abdomen.* Viscera healthy.

Case XXXVI.

Mary Sullivan, æt. 26, married. Admitted on the 14th day of disease; pain of head severe from

the beginning; continues unabated and even violent; no sleep; face pallid; expression depressed; pulse 81; abdomen tender; tongue foul and dry. V. S. ad ℥xij.

18th. Pain of head gone; delirium; pulse 70, soft; tongue more dry.

24th. Pain of head, which had returned slightly on some of the preceding days, was, from this period, finally lost in insensibility; no longer conscious; prostration; great restlessness; almost constant moaning; occasional retching; pulse 72.

26th. Continues perfectly insensible; all the stools passed in bed; pulse suddenly rose to 120, on the following day fell to 102; eyes half opened and injected: no material change till 29th, died.

Head. Membranes and substance of brain appeared pretty healthy; all the ventricles enlarged, and contained about three ounces of limpid serum; a considerable quantity, also, at base; some coagulable lymph effused on that part of the arachnoid which covers the tuber annulare. *Thorax.* [Pleuræ adherent; substance of lungs full of tubercles, in different stages of disease.] *Abdomen.* [Liver hard;] other viscera healthy.

Case XXXVII.

Ann Boon, æt. 14, admitted on 10th day of fever. Attacked in the beginning with severe head-ache,

which still continues; abdomen tender; lips and teeth sordid; tongue brown and dry; pulse 120.

11th. Pain of head undiminished; eyes heavy and suffused; delirium; tongue red, dry, and glazed; pulse 108.

13th. Pain of head quite gone; delirium; pulse 118.

19th. Much noise through the night; peevishness during the day; pulse 108.

20th. More insensible; can give no answer to any question; pulse 118.

22d. Constant rolling of the head; pupils dilated; all the stools passed in bed; pulse 108.

29th. Eyes vacant and staring; pupils contracted; head sunk in bed; legs drawn up; stools passed in bed; urine abundant; pulse 117, regular and of good power.

30th. Skin covered in several places with vesicles, which discharge a thin ichor. Died.

Head. Membranes and substance of brain vascular; upwards of three ounces of serum in the ventricles and at base; much similar fluid in theca vertebralis. *Thorax.* Viscera healthy. *Abdomen.* Mesenteric glands greatly enlarged; some of them suppurating.

Case XXXVIII.

Richard Maciff, æt. 30, admitted on the 22d

day of fever. No account can be obtained of its previous history: at present he lies quite prostrate and perfectly insensible; eyes wild and rolling; pupils dilated and insensible to light; constantly picking at the objects around him; pulse not to be counted, on account of his extreme restlessness, but it feels like a soft cotton cord, and nearly without pulsation.

23d. Profound coma; senseless muttering; constant muscular tremor; squinting; neither stool nor urine has been passed since admission; pulse 96, soft, not intermittent.

24th. Coma undiminished; one stool passed in bed; urine drawn off by the catheter; pulse 100, extremely feeble.

25th. No change.

26th. Died.

Head. Dura mater vascular; arachnoid highly vascular; that portion of it covering the tuber annulare distended into a bag of considerable size, filled with serum; all the ventricles enlarged and distended with serum. *Thorax.* [Right lung contained tubercles in various stages of disease.] *Abdomen.* [Liver of unusually deep red colour; in right and left lobes two small sacs, filled with calcareous matter; on surface of spleen a sac, containing matter similar to that in the liver.]

Case XXXIX.

William Tennant, æt. 18, tailor. Admitted on the 8th day of fever; at present much pain of head, back, and extremities; no sleep; face flushed; epigastrium tender; tongue red round margin, coated in middle; much thirst; pulse 99. V.S. ad ℥x.

9th. Pain of head continues; scarcely any sleep; pulse 96. C.C. ad ℥x. nuchæ.

10th. Pain of head unrelieved, particularly severe over the forehead; face flushed; tongue brown and dry; pulse 92.

11th. Pain of head quite gone; no longer conscious of any uneasiness in the limbs; much drowsiness; delirium; pulse 104.

12th. Rather more sensible; delirium; tongue unchanged; stools and urine passed in bed; pulse 112.

13th. Delirium increased; eyes glistening; pulse 120.

14th. Mind more distinct this morning; much delirium through the night; respiration hurried; pulse 130. Died next morning.

Head. Membranes and substance healthy; on the under surface of right hemisphere, corresponding with the middle lobe, a remarkably deep and extensive depression, the deepest part corresponding to the centre of the brain; this depression was lined

with the arachnoid, which being reflected formed a sac, that contained 12 ounces of serous fluid, and completely filled the cavity. The cerebral substance beneath and around was perfectly sound and entire. *Thorax.* Viscera healthy. *Abdomen.* Mucous membrane of ilium and cæcum extensively and greatly ulcerated.

4. *Vascularity, &c. with preternatural Firmness of Brain.*

Case XL.

Thomas Conolly, æt. 58, labourer. Admitted on 7th day of fever: severe pain of head early in the attack which has continued without intermission, accompanied with vertigo; scarcely any sleep; face flushed; no uneasinesss of chest; abdomen not tender; no stool for four days; tongue loaded and dry; pulse 96, weak.

8th. Less pain of head; no improvement in other symptoms; pulse 92.

9th. Scarcely any pain of head; no sleep; delirium; muscular tremor; tongue brown and dry; pulse 111.

10th. Pain quite gone; more insensible; constant talkative delirium; colour of cheek dusky, almost livid; respiration hurried; stools and urine in bed; pulse 112, feeble.

11th. Died.

Head. Membranes vascular; arachnoid thickened and opake; substance of brain highly vascular and preternaturally firm; some fluid beneath membranes and in ventricles. *Thorax.* [Pleuræ adherent;] lungs gorged with blood. *Abdomen.* Liver and spleen exceedingly softened, readily breaking down beneath the finger.

Case XLI.

Mary Tiffin, æt. 25, servant. Perfectly insensible: no account can be obtained of history or duration of disease: abdomen tender; tongue loaded, moist; pulse 99.

2d day after admission scarcely any sleep; delirium; muscular tremor.

3d. Insensibility continues; constant delirium; has passed neither stool nor urine; latter drawn off by catheter; pulse 124, feeble and fluttering. Died next morning.

Head. Dura mater and arachnoid natural; pia mater vascular; substance of brain highly vascular and unusually firm; cerebellum soft; effusion beneath arachnoid and at base. *Thorax.* [Substance of both lungs filled with miliary tubercles.] *Abdomen.* [Liver studded with tubercles, similar to those of the lungs; spleen full of the same kind of tubercles, excepting that they were larger, and some of them were suppurating;] pancreas extremely firm.

Case XLII.

Mary Poulston, æt. 50. No account to be obtained of duration of disease: lies quite insensible and prostrate; frequent jactitation of the arms; face flushed; respiration stertorous; cheeks alternately expanding and collapsing during inspiration and expiration; tongue not to be protruded; stools and urine in bed; pulse 138, weak, and easily compressed.

2. Died.

Head. Dura mater vascular; arachnoid thickened and opake; substance of brain highly vascular and firm. *Thorax.* All the viscera perfectly healthy. *Abdomen.* Mucous membrane of intestines vascular, without ulceration; mesentery inflamed; [contained a calcareous deposit of an oval shape included in a cyst.]

Case XLIII.

William Ashley, æt. 65, messenger. Admitted on 4th day of fever: slight occasional head-ache; mind distinct; scarcely any sleep; face flushed; no uneasiness of chest or abdomen; slight cough; pulse 81.

5th. Slight head-ache; little sleep; pulse 82.

6th. Pain of head gone; pulse 90.

8th. No pain; mind confused; delirium; stools in bed; pulse 108.

10th. Prostration; pulse 111.

11th. Perfectly insensible; great prostration; deglutition difficult; hiccup; pulse 116, extremely feeble.

12th. Died.

Head. Membranes and substances of brain intensely vascular; perhaps as much so as in pure phrenitis; substance exceedingly firm; viscera of thorax and abdomen healthy.

Case XLIV.

Francis Hodgkinson, æt. 15, servant. Admitted on the 8th day of fever: pain of head and vertigo, which ushered in the attack already gone; mind confused; scarcely any sleep; slight pain of chest on full inspiration; slight cough; abdomen not tender; tongue red at margin, centre covered with yellow fur; pulse 117, easily compressed.

9th. No pain; much confusion; much restlessness; respiration oppressed; tongue still most; lips and teeth sordid; stools in bed; pulse 112.

13th. Petechiæ; tongue dry; pulse 110.

15th. No material change in symptoms. Died.

Head. Membranes vascular; substance exceedingly vascular and firm; some fluid in ventricles and at base. *Thorax.* Lower lobe of left lung of dark

red colour and inflamed. *Abdomen.* Mucous membrane of small intestines vascular, and of dark red colour.

Case XLV.

William White, æt. 17, labourer. Admitted on 6th day of fever: pain of head; especially over forehead; mind distinct; some sleep; face flushed; no thoracic or abdominal uneasiness; tongue white and dry; no stool for a week; pulse 126.

7th. Pain of head very severe; pulse 117; V. S. ad ℥xij.

8th. Died this morning most suddenly and unexpectedly, after having complained of violent pain of the head.

Head, not examined till three days after death, yet the substance of the brain was exceedingly firm, and seemed to distend and protrude its membranes, so that there seemed something like hypertrophy of its substance; viscera of thorax and abdomen healthy.

Case XLVI.

John Mullins, æt. 28, servant. Stated to be a relapse after a fever of three weeks duration: at present, lies perfectly senseless; noisy delirium; extreme restlessness; pulse 70.

2d day after admission, continues perfectly insensible; respiration slow and stertorous; tongue not to be protruded; stools passed in bed; pulse 60.

6th. Remained nearly in the same state until this morning. Died.

Head. Dura and pia mater highly injected; surface of brain quite dry and hard; substance throughout exceedingly firm, and thickly crowded with bloody points; cerebellum soft; pituitary gland soft; all the ventricles, especially the third, exceedingly enlarged and quite full of limpid serum; communicating passages greatly distended; an ounce of serum at base. *Thorax.* [Left pleuræ completely adherent; both lungs full of tubercles, many of which in the left lung were softened and others were in a state of suppuration.] *Abdomen.* Mucous membrane of small intestines inflamed and thickened; no ulceration. [Sigmoid flexure of colon contracted into the form of a small white cord of very narrow calibre, the superior extremity of which was blocked up by a large scybala; and beyond it there was a great accumulation of fæces; spleen very small; right kidney weighed only six drachms; left seven ounces and a half; liver extremely small, weighing only two pounds, six drachms; it lay across the epigastrium and adhered by a preternatural membrane to the diaphragm on the left side; mesentery wasted.]

5. *Vascularity, &c. with Softening of the Brain.*

Case XLVII.

Sarah Hampden, æt. 50. No account to be obtained of history of disease, but it is stated that this is the 22d day of her fever: at present mind quite fatuous; some uneasiness of chest; cough; abdomen not tender; tongue red and dry; pulse 99.

24th. Subsultus; urine in bed; no stool.

26th. Mind rather more distinct and more firm; less subsultus; submaxillary gland enlarged and painful; pulse 108.

28th. Much prostration; no other change.

30th. Increasing prostration; pulse 120, feeble.

32d. Died.

Head. Dura mater vascular and thickened; arachnoid white and opake; substance of brain slightly vascular, but very soft; pituitary gland suppurating; all the ventricles distended with serum. *Thorax.* [Universal adhesion of the pleuræ; lungs studded with tubercles.] *Abdomen.* Mucous membrane of small intestines inflamed; no ulceration; pancreas very hard; liver much softened.

Case XLVIII.

Virginia M'Mahon, æt. 8, admitted on 14th day

of scarlet fever. No account can be obtained of previous history; mind quite confused; extreme restlessness; abdomen tender; tongue very red and sore; tarsi red and irritable.

15th. Delirium; moaning; no sleep; more sensible to-day; abdomen less tender; pulse extremely quick and weak.

18th. Without any material change, died.

Head. Arachnoid opake; effusion between it and the pia mater; substance of brain exceedingly soft; two ounces of serum in the ventricles. *Thorax.* Mucous membrane of trachea and bronchi vascular; bronchial tubes filled with mucus. *Abdomen.* Mucous membrane of small intestines vascular; mesenteric glands enlarged.

Case XLIX.

Dorcas Wingrove, æt. 23, servant, admitted on the 6th day of fever. Attack commenced with violent pain in the head, preceded by no other symptom that was observed; this pain still continues exceedingly severe, and is confined chiefly to the right eye; mind distinct; no sleep; much restlessness during the night; countenance pallid; no uneasiness of chest; abdomen tender; bowels constipated; tongue pale, clean and moist; pulse 93, weak.

7th. Pain of head undiminished; delirium; three

stools in bed; tongue brown and quite dry; pulse 100, firm, strong, and sharp. C.C. ad ℥xij. nuchæ.

8th. Pain of head gone; no sleep; noisy delirium; stools in bed; pulse 120, weak.

9th. Slight, but very transient amendment.

11th. Comatose; lies quite prostrate; stools in bed; pulse 130, feeble.

12th. Died.

Head. Membranes vascular; arachnoid opake; corpus striatum in part highly inflamed, in part softening to suppuration; viscera of thorax and abdomen healthy.

Case L.

Thomas Proctor, æt. 45. Date and progress of disease unknown: at present perfectly insensible; extreme restlessness; eyes dull and vacant; tongue dry; pulse scarcely to be distinguished.

2d day after admission. Insensibility the same; almost constant moaning; features sunk; expression of countenance anxious; pulse 118. Next morning died.

Head. [In falciform process of dura mater an ossification, two inches and a half in length and half an inch in breadth, with several similar ossifications along the course of the longitudinal sinus;] the arachnoid and pia mater consolidated into one thick, opake and yellow membrane; substance of brain highly

vascular and very soft; cerebellum quite disorganized, being broken down into a yellow, puriform mass of matter, a considerable portion of which lay loose on the floor of the cranium; all the ventricles full of serum, in which floated numerous flakes of lymph; base immersed in similar fluid. *Thorax.* Viscera healthy. *Abdomen.* Mucous membrane of jejunum and ilium much inflamed, neither thickened nor ulcerated; [liver greatly enlarged; walls of bladder half an inch thick.]

The following is placed at the end of the cerebral cases, not because it illustrates any new circumstance in the condition of the brain, but because, while the symptoms and the pathology are prominently cerebral, it affords one of the most complete examples of the peculiar affection of the joints already referred to.

Case LI.

George Carter, æt. 28. Admitted on the 4th day of scarlet fever: throat sore; deglutition painful; cough; no pain of chest or abdomen; nausea; tendency to vomiting; no pain of head; mind distinct; pulse 108, weak.

5th. No pain; eyes suffused; pulse 120, firmer.

6th. Mind confused; eruption partial, interspersed with papulæ; tongue of strawberry appearance, and rough from prominence of papillæ; pulse 124.

7th. Delirium, so violent as to require restraint; no sleep, pulse 120.

8th. Eruption changed to copper-colour; tongue dry; pulse 112.

10th. Inflammation of parotid gland.

18th. Tumour of left parotid exceedingly hard and slowly suppurating; slight difficulty in swallowing; pulse 96.

21st. Tumour opened last night and discharged two ounces of bloody pus; pulse 108.

28th. Alternately mended a little and then fell back to his former state until last night, when swelling of right wrist and left knee came on, attended with excruciating pain and great heat without any discoloration: 12 leeches have been applied with considerable relief: mind confused; no sleep; countenance anxious; face flushed; rigors; pulse 135.

24th. Other wrist and knee have begun to swell and are excessively painful; left wrist and knee which had been more easy, again extremely painful; vomiting; respiration hurried; pulse 116, weak. Died.

Head. Much serum both in ventricles and at base. *Thorax.* Viscera healthy. *Abdomen.* Mucous membrane of the ilium ulcerated and extremely dark.

All the large joints swollen and red: on opening the knee joints they were found to contain several

ounces of serum mixed with pus; the cellular tissue in the neighbourhood was partly inflamed, and partly mortified and sloughing: both wrists were in a similiar condition.

Case XII.

James Solden, æt. 44, plasterer. For symptoms see page 167.

Head. Membranes of brain vascular; substance highly vascular; some effusion beneath the arachnoid. *Thorax.* Viscera healthy. *Abdomen.* Mucous membrane of ilium vascular; no ulceration; mesenteric glands enlarged.

Case XIII.

John Clark, æt. 17. For symptoms see page 168.

Head. Corresponding portions of the pericranium and dura mater detached from the occipital bone to the extent of four inches in length by three in width; coagulated blood effused between the dura mater and the cranium; vessels of the membranes turgid with blood; substance of brain vascular; effusion between the membranes; a little at base. *Thorax.* Viscera healthy. *Abdomen.* Mucous membrane of ilium greatly inflamed; cæcum ulcerated.

From the study of these cases we see that the process of disease is as uniform as that of health, or of any other process of nature; that certain phenomena constantly take place; that they follow a determinate order; that the events seldom or never vary; that their relations to each other never change; that in these cerebral cases of fever a preternatural fulness and apparently increase in the number of the blood-vessels of the brain and spinal cord, or of their membranes is always present; or that if a case do now and then occur in which even *no* preternatural vascularity can be discovered such an event is exceedingly rare; that this fulness and increase of the blood-vessels is either identical with, or passes into the state of inflammation; that the state of inflammation, after a certain period, produces results which are known to be effects of inflammatory action in other parts of the body; that these products of inflammation consist of a given number; that the whole of that number never concurs in any one case, but that two or more are frequently found in combination; that the laws by which any one of these is formed rather than any other are at present wholly unknown; while instances do occasionally occur, although they are extremely rare, in which the state of mere vascularity alone subsists without the formation of any inflammatory product that can be discovered.

From the study of the history of these same cases

we further see that the indications of this inflammatory state of the brain and spinal cord or of their membranes are as uniform as the existence of the state itself; that certain symptoms invariably accompany it; that these symptoms not only declare with absolute certainty that this process is going on, but likewise, in general, clearly mark its progress; and that this series of symptoms and the place in which each stands in the series is as follows: namely,

Pain in the head, or giddiness, or some other uneasy sensation in this organ, attended with a loss of sleep and with a derangement in all the sensorial faculties,—these are the signs of the presence of the disease in the brain or its membranes. Pain in the back, loins, or limbs, or diminution of the power of voluntary motion—these are the signs which mark the existence of the disease in the spinal cord or its membranes. These symptoms having been present a certain time, and at length succeeded by—diminution of the pain or uneasiness *without a corresponding diminution in the other febrile symptoms*, but with an *increase* in *some* of them; for instance, with an increase of the sleeplessness and restlessness: at last, total cessation of all pain or uneasiness, together with a diminution of the sensibility—these are the signs which mark the progress of the disease, and which, in general, denote a transition from the state of mere inflammation to the formation of some inflammatory pro-

duct. Thus far the change of state is certain and the signs which denote it invariable; to the latter other symptoms are added which occur in the great majority of cases, but not in all; namely, delirium, muscular tremor, involuntary and unconscious stools, acceleration, and in general, increased and increasing weakness of the pulse. Other accessory symptoms still frequently occur and with considerable regularity, but as these are more variable the student is referred to the cases themselves, the study of which can alone teach when they may be expected.

Since the diseased states of the brain and spinal cord or of their membranes, which the preceding pathology discloses, exist, as is there shown, in all degrees of intensity, so the signs by which these states are denoted may vary from a prominence which it is impossible to overlook to an unobtrusiveness which it requires careful attention to discover. And from causes which we do not yet understand, the prominence of the sign is not always in accordance with the intensity of the state; but the important truth here maintained is, (and the more the practitioner observes, the more satisfied he will become that it is a truth,) that whenever these states exist in sufficient intensity to produce death, their presence may be discovered during life. It is not affirmed that these states can be distinguished one from another; but it is contended that the existence of some one or more of them may be ascertained

with absolute certainty. As we sometimes see death occur, preceded by the ordinary symptoms of cerebral inflammation, when, on examination after death, nothing can be discerned but preternatural vascularity of the membranes or substance of the brain, without the presence of any inflammatory product that can be distinguished; and as, moreover, when *some* inflammatory product is generated, we are in total ignorance of the laws by which, in one case, the blood-vessels pour out serum, in another secrete pus, in a third soften, and in a fourth indurate the cerebral substance; so the signs which indicate that these events have taken place are to us, at present, uncertain. There can be no question that the laws, according to which each of these events is produced, are fixed and invariable in their operation; and each may possibly be attended with its specific and therefore diagnostic sign; but it is certain that we have not yet discovered the one nor observed the other. And the preceding cases have been detailed under the heads assigned them, rather with the view of making the pathology clear, than in the hope from this arrangement of affording any guide to practice. In the mean time, what we may know, and ought to know, is when inflammation exists: what we may, in general, further know is, when some product of inflammation has been poured out still more to oppress the brain: to the thoughtful and discerning practitioner it would be without doubt a high satisfaction to be able

to carry his diagnosis still further, and to ascertain *what* that product is: the desire to arrive at such precise and perfect knowledge appears to me to be in the highest degree meritorious: the constant and unwearied endeavour to acquire it may not always succeed with reference to the particular object immediately pursued, but it cannot fail to increase his power and to strengthen his habit of observation; and the sure reward of a devotion thus truly honourable and faithful to the duties of his profession, if it should not be, as it may not invariably be, the confidence and the gratitude of his patient, will at least be the proud consciousness that he has deserved both.

Were it possible to ascertain with absolute certainty and with perfect exactness in which of its various modes inflammation of the brain and its membranes terminates, it would be a subject of interest, as far as we can at present perceive, rather to the physiologist and pathologist than to the practical physician. To the latter the great fact which it is of paramount importance that he should know is, that inflammation is going on in the brain of his patient, and that if he cannot put a stop to it in the course of a day or two, it will in that short space of time terminate in some irreparable change of structure, of which death will be the inevitable consequence. This, it is again repeated, it is always in his power to know; and as there is no one fact which can or which ought to have so much influ-

ence upon his practice, so there is no diagnosis which it is of so much importance that he should acquire the habit of forming.

II. Cases in illustration of the Morbid Changes which take place within the Chest; or Thoracic Cases.

Case VII.

Angelica Fidgett.

For symptoms see page 137.

Thorax. Mucous membrane of bronchi, in all their ramifications, exceedingly inflamed; bronchial tubes full of mucus; [substance of left lung extremely inflamed; left pleuræ adherent; right pleuræ and lung much less severely affected.] *Head.* Substance of brain vascular. *Abdomen.* All the viscera healthy except the uterus and its appendages, which were slightly inflamed.

Case VIII.

John Potter, æt. 21.

For symptoms see page 139.

Thorax. Mucous membrane of bronchi, in all their ramifications, of dark red colour; bronchial glands much enlarged; [pleuræ of right side generally adherent; substance of lungs consolidated; pericar-

dium contained four ounces of serum;] heart natural. *Abdominal* and *cerebral* organs healthy.

Case XIV.

Alexander Crombie, æt. 19, seaman.

For symptoms see page 171.

Thorax. Mucous membrane of bronchi, in all their ramifications, highly vascular; bronchial tubes full of mucus, mixed with pus. *Head.* Dura mater adherent with preternatural firmness to cranium; substance of brain unusually firm; posterior lobes crisp, and cut almost like cartilage; anterior lobes, when cut into, abound with bloody points; cerebellum exceedingly firm. *Abdomen.* Peritoneal coat of small intestines in general vascular; eight or ten portions of the jejunum and ilium, to the extent of three or four inches each, intussuscepted; mucous membrane of these parts extensively ulcerated, some of the ulcers circular, the greater number oblong, and at least two inches in length; mucous membrane in general highly vascular, but that surrounding the ulcers less so than the other parts; mesenteric glands corresponding to ulcerated portions of intestine enlarged and vascular; crimson spots on convex surface of liver; gall-bladder distended with a yellowish watery fluid; spleen enlarged, and so soft as to be easily broken down under the finger.

Case LII.

Thomas Lewis, æt. 51, taylor, admitted on the 8th day of fever. Complaint commenced with general pains, nausea and vomiting, together with cough and dyspnœa. At present there is no pain of chest except on coughing, which produces some uneasiness; cough frequent, with copious sputa; pain of epigastrium; tongue exceedingly parched and dry; much thirst; bowels purged; some pain of head, chiefly in forehead; mind distinct; scarcely any sleep; face pallid; pulse 126, weak. Early next morning died.

Thorax. Mucous membrane of bronchi inflamed; [pleuræ of right lung covered with coagulable lymph; substance of right lung universally consolidated, and infiltrated with tubercular matter;] left lung gorged. *Abdomen.* [Liver indurated; crisping under the knife; kidneys indurated.] *Head.* Membranes and substance of brain vascular.

Case LIII.

Mary Sullivan, æt. 40, married, admitted on the 15th day of fever. Some pain of chest; severe cough; much pain of head, with sense of noise; mind dull; scarcely any sleep; face flushed; skin warm; tongue foul and dry; pulse 98.

16th. Frequent short cough, without expectoration; mind confused, yet sensible when spoken to; pulse 90.

17th. Thoracic and cerebral symptoms unchanged; pulse 111, indistinct.

26th. Cough diminished; sensibility increased; she appeared in all respects better until this day, when the cough became more frequent and the expectoration purulent; pulse 60.

27th. Cough frequent; expectoration the same; respiration short and hurried; pulse 60, intermittent.

30th. Respiration became more and more hurried, and the strength rapidly sunk. Died.

Thorax. Mucous membrane of bronchi inflamed; bronchial tubes full of mucus, mixed with pus; [pleuræ adherent; patches of left lung hepatized.] *Abdomen.* Liver and spleen extremely softened, breaking down under the fingers into a mass like coagulated blood. *Head.* Membranes and substance of brain pretty healthy.

Case LIV.

Sarah Peach, æt. 23, married, admitted on the 17th day of fever. Thoracic symptoms came on with the very commencement of the disease: at present there is no pain of the chest, but much cough; respiration short and hurried; colour of the face quite dusky; some pain of head; mind confused;

pulse 100; abdomen not tender; tongue of beef-steak character; bowels regular.

18th. Cough and hurried respiration continue; dusky colour of face has become livid; delirium; low muttering talkativeness; pulse 116; teeth sordid; stools in bed.

19th. Severity of bronchial symptoms much increased; respiration panting; colour of skin in general, but especially of face, livid; deglutition difficult; pulse 124, weak. Died following morning.

Thorax. Mucous membrane of bronchi inflamed; bronchial tubes filled with mucus, mixed with pus; mucous membrane of trachea vascular; [both lungs studded with miliary tubercles.] *Head.* Dura mater and arachnoid highly vascular; theca of spinal cord highly vascular; substance of brain vascular. *Abdomen.* [Spleen contained a small mass of cheesy tubercles near its surface;] patches of mucous membrane of small intestines inflamed, but without ulceration.

Case LV.

Isabella Lora, æt. 12. Admitted on the 3d day of scarlet fever; throat sore; deglutition painful; slight cough; skin covered with copper-coloured eruption; tongue loaded in middle with white fur; red around edges and at tip; some pain of head; pulse 120.

4th. Much improved; less pain of throat and head; pulse 96.

14th. Convalescent and gradually gaining strength up to this day; early this morning seized suddenly with rigors attended with vomiting: abdomen tender; three stools; pulse scarcely to be felt; mind distinct.

15th. Left parotid painful, hard and swollen; throat again inflamed; pulse 124.

16th. Early this morning seized with symptoms of severe laryngitis, for which leeches have been applied with partial relief; tonsils and uvula much swollen; respiration exceedingly laborious; pulse 140, sharp. Died same day.

Thorax. Tonsils much enlarged; mucous follicles full of purulent fluid mixed with blood; some of them exceedingly enlarged, and communicating so as to form cavities; membrane covering the upper part of larynx highly vascular and much thickened, especially that about the epiglottis and the arytænoid cartilages; mucous membrane below the rima glottidis healthy; both the parotids, the sublingual, and the maxillary glands enlarged. *Abdomen.* Peritoneal coat of the intestines inflamed and thickened. *Head.* Membranes and substance of brain tolerably healthy.

Case LVI.

Mary Anne Lawrence, æt. 22, servant, admitted on the 5th day of scarlet fever. Throat sore; deglutition painful; slight uneasiness and sense of tightness in chest; frequent cough, with copious expectoration; abdomen not tender; tongue characteristic; skin warm, covered with scarlet eruption; slight pain of head; pulse 126, strong. V.S. ad ℥xvj.

6th. Felt much relief after venesection; dyspnœa returned in the evening, and she was again bled to the extent of sixteen ounces: blood first drawn with firm buff, that of the second bleeding with coagulum firm but not buffy; at present cough severe, short, dry; dyspnœa; pulse 148.

7th. Tightness of chest continues; cough better; pulse 144, tremulous. Died next day.

Thorax. Uvula and surrounding parts much inflamed, but not ulcerated; mucous membrane of trachea inflamed; bronchial tubes inflamed, and filled with frothy mucus; [pleuræ of both lungs adherent; lungs contained a few tubercles; thyroid gland enlarged, and so hard as to be cut with difficulty.] Abdominal and cerebral organs tolerably healthy.

Case LVII.

Ann Wormington, æt. 24, servant.

After some previous indisposition, seized, the day before admission, with shivering, attended with pain of bowels, nausea and vomiting; throat sore; deglutition painful; scarlet eruption on skin; no uneasiness of chest; no cough; abdomen tender; tongue covered with yellow fur; bowels purged; mind confused; eyes injected and heavy; pulse not to be counted. Died four hours after admission.

Thorax. Mucous membrane of trachea of dark red colour; epiglottis quite blackened; arytænoid cartilages ulcerated; substance of lungs much gorged. *Abdomen.* Viscera healthy. *Head.* Membranes vascular; substance of brain preternaturally firm.

Case LVIII.

Margaret Scandling, æt. 26, admitted on the 8th day of fever. No uneasiness of chest; no cough; pain in head; severe pain in limbs and bones; scarcely any sleep; threatening erysipelas on face; abdomen tender; tongue white and dry; no stool for seven days; pulse 88, weak.

10th. No uneasiness of chest; pain of head diminished; pulse 72.

16th. Erysipelas of cheek, spreading to scalp, and attended with considerable pain; tongue dry; pulse 96.

19th. Erysipelas extending; this morning attacked with severe dyspnœa, attended with husky noise in

inspiration; deglutition extremely difficult. Hirud. x. gutturi. C.C. ad ℥xij. nuchæ. Capiat Hydrar. Submuriat. gr. ij., c. Pulv. Opii, gr. ss. 6ta q. h.

20th. Respiration and deglutition unrelieved; erysipelas of face very painful; mouth sore; mercurial fetor; pulse 120, soft.

21st. Respiration unchanged; deglutition more painful; erysipelas increased, passing into suppuration; delirium; pulse 90.

22d. Difficulty of deglutition undiminished; respiration rather more easy; pulse 98; much pain of head.

23d. No change in the respiration, deglutition, or erysipelas; much discharge from both ears; left elbow attacked with swelling; heat and excessive pain.

25th. Died.

Thorax. Mucous membrane of larynx inflamed; epiglottis much thickened; both arytænoid cartilages in a state of suppuration, right nearly destroyed; cellular substance about the right parotid in a state of suppuration; [pleuræ of right side adherent; substance of both lungs infiltrated.] *Head.* Membranes and substance of brain vascular; serum in lateral ventricles. *Abdomen.* [Mucous membrane of small intestines in several points raised in the form of vesicles, containing air;] spleen soft.

N.B. In this case, the erysipelas evidently extended from the external skin to the mucous membrane of the throat and larynx, an event which is

not very common in fever, but which does occasionally happen. The affection of the elbow-joint was clearly of the same nature as that described in case 51.

Case LIX.

Charles Tyler, æt. 54, chocolate maker, admitted on the 7th day of fever. No pain of chest; slight cough; abdomen tender; tongue loaded and dry; thirst; bowels loose; no pain of head; much pain of loins; some vertigo; mind distinct; no sleep; pulse 90, full and firm. V.S. ad ℥xx.

8th. Pain of head and abdomen gone; pulse 102, full and sharp; blood with very firm buff. Repr. V.S. ad ℥xij.

11th. No return of pain in any organ; mind confused; no sleep; great restlessness; delirium; muscular tremor; respiration short and hurried, with mucous rattle; tongue white and dry; pulse too indistinct to be counted.

12th. Delirium became exceedingly violent soon after yesterday's visit; there was neither pain nor cough, but he passed by the mouth a considerable quantity of fluid blood; respiration became more and more hurried and he died in the evening.

Thorax. Mucous membrane of the trachea and bronchi inflamed; [the substance of the left lung studded with nodules, consisting of coagulated blood,

forming the apoplexia pulmonalis of the French writers:] viscera of the head and abdomen healthy.

Case LX.

John Wotton, æt. 46, plaisterer. Admitted on the 7th day of fever: attack commenced with chilliness, succeeded by cough and severe pain in the region of the heart; has had two similar attacks of pain which he soon recovered; at present he has so much pain in the side that he cannot take a full inspiration; frequent cough exciting pain; respiration short and painful; abdomen not tender; tongue white and moist; pain of head; little sleep; pulse 120, full and hard; skin hot.

8th. Pain of chest diminished; can take full inspiration with less uneasiness; cough less frequent; respiration little changed; pulse 102, intermittent.

9th. Respiration much more easy; cough less frequent, with copious mucous expectoration; pulse 108, intermittent.

10th. Says he is quite free from pain everywhere; cough again increased; respirations 50; pulse 110, not intermittent; delirium.

11th. Respirations 60; no sleep; great restlessness; pulse 108, intermittent.

14th. Perfectly insensible; scarcely to be retained in bed; respiration extremely quick; pulse not to be counted. Died.

Thorax. Mucous membrane of bronchi highly vascular; [left lung adherent to parieties of chest by a layer of coagulable lymph nearly an inch in thickness; substance of lung completely hepatized; pericardium exceedingly thickened throughout, and universally adherent to the heart; heart itself soft and flabby; inner coat of aorta of reddish brown colour.] *Head.* Vessels of pia mater exceedingly turgid; effusion beneath it and the arachnoid; substance of brain very much softened. *Abdomen.* Mucous membrane of ilium vascular.

III. Cases in Illustration of the Morbid Changes which take place within the Abdomen; or Abdominal Cases.

Case LXI.

Thomas Hindmarsh, æt. 26. Admitted on the 10th day of fever: too indistinct to give any account of previous symptoms; at present abdomen tender; tongue loaded and dry; bowels purged; mind confused; very deaf; eyes red and suffused; pulse 108, firm.

11th. Abdomen less tender; five stools; insensibility increased; pulse 104.

12th. Abdomen a little tender; tongue quite dry; three stools in bed; noisy delirium; eyes wild and staring; pulse 108.

13th. Tongue no longer to be protruded; no stool; scarcely at all sensible; eye-lids half closed; pulse 96, firm.

21. Abdominal and cerebral symptoms little changed; sensible of some pain in chest; cough; dyspnœa; pulse 108.

23d. Abdomen still tender, and now become tympanitic; four stools in bed; perfectly insensible; constant muttering delirium; muscular tremor; large slough on sacrum; pulse 116.

25th. Died.

Abdomen. Peritoneal coat of intestines in general vascular; mucous coat of small intestines highly vascular, and indicated approaching ulceration. *Head.* Not examined. *Thorax.* [Pleuræ of both sides adherent throughout; substance of both lungs healthy; slight effusion of serum into pericardium.]

Case LXII.

Isaac Grey, æt. 30. Admitted on 22d day of fever; no account to be obtained of the previous symptoms; at present the abdomen in general is exceedingly tender on pressure, but especially the epigastrium; tongue brown, dry in centre, moist at edges; very tremulous; scarcely at all sensible, yet seems very apprehensive, almost constantly muttering and crying; face flushed; eyes wild; skin speckled with petechiæ; pulse 112.

23d. Abdomen still very tender; says he is without pain; four stools; delirium; muscular tremor; pulse 100, feeble.

24th. In the early part of last evening became violently delirious, and was extremely restless, constantly tossing his arms about, and throwing off the bed-clothes. Died.

Abdomen. All the coats of the stomach appeared much attenuated; mucous membrane of cardiac extremity so soft as to lacerate under examination; that of pyloric end exhibited numerous minute spots of a deep red colour, as if touched with a paint-brush; peritoneal coat of ilium of dark red colour; other viscera healthy. *Head.* Arachnoid thickened and opake; considerable effusion between it and the dura mater; substance of brain vascular; half an ounce of serum in each ventricle. *Thorax.* [Right pleural cavity contained one ounce and a half of bloody fluid, left eight ounces; substance of both lungs much condensed, and on their surface an appearance as if blood had exuded and coagulated. Pericardium contained two ounces of serum: heart healthy.]

Case XLIII.

Hannah Swift, æt. 20, servant. Admitted on the 8th day of fever: abdomen, especially the epigastric region, tender; tongue clean, red, chapped; lips parched and cracked; some pain of head, back, and

limbs; mind rather confused; pulse 120, soft, and feeble.

9th. The abdomen, which continues tender, has become swollen and tense; two stools.

15th. Abdomen still very tender, swollen, and hard; tongue dry; two stools; vomiting of much green coloured fluid; pain of head gone, but sense of weight in it.

17th. Tenderness of abdomen and vomiting continue; delirium; pulse 100, small and feeble.

19th. Tenderness of abdomen increased; no vomiting; tongue the same; pain of head returned; delirium; erysipelas of face; pulse 109, feeble.

21st. Erysipelas extending to arm; tongue brown, dry, and cracked; much delirium.

22d. Cheeks livid; extremities cold and livid; pulse imperceptible. Died.

Abdomen. Mucous membrane of ilium highly inflamed, and ulcers just forming; other viscera healthy. *Head.* Dura mater vascular; arachnoid opake; substance of brain vascular; some fluid in ventricles. *Thorax.* Mucous membrane of bronchi inflamed: tubes filled with mucus mixed with pus: [pleuræ in part adherent; some serous fluid in both cavities; substance of lungs natural.]

Case LXIV.

Thomas Sexton, æt. 18, servant. Admitted on

3d day of scarlet fever; complaint came on with nausea, vomiting, and pain of the limbs; at present throat sore; deglutition easy; chest free from pain; no cough; abdomen tender, especially in the region of the epigastrium; tongue white in middle, red around margin; no stool for several days, because, as he supposes, he has vomited all his medicine; pain of head; vertigo; face flushed; frequent attacks of epistaxis during his vomiting, always relieving the head-ache; pulse 102; skin warm; no eruption.

4th. Pain of head gone; vertigo continues; eyes dull and heavy; face flushed; no vomiting; pulse 96.

5th. Sense of vertigo lessened; tongue brown and dry; four stools; pulse 84.

7th. Abdomen tender; tongue brown and dry; six stools; pain of head returned; much pain of back; no sleep; delirium.

11th. Less sensible: drowsy; delirium; three stools.

12th. Insensibility increased; drowsiness approaching to coma; cheeks dusky; tongue with dark brown crust, dry; stools in bed; pulse 102, weak.

16th. Abdomen tender; tongue not to be protruded; three stools all in bed; pulse 130, extremely weak; great prostration.

17th. Countenance sunk; respiration short and hurried; four stools; more prostrate.

18th. No change excepting that the prostration is still greater. Died.

Abdomen. Mucous membrane of ilium and cæcum extremely vascular, and contained several small ulcers, some of which were merely the abraded points of enlarged mucous glands; other glands in the neighbourhood much enlarged but not ulcerated; mesenteric glands very much enlarged; liver mottled; spleen larger than natural; pancreas indurated. *Head.* Arachnoid highly vascular; substance of brain natural; gelatinous effusion between the arachnoid and pia mater; half an ounce of serum at base. *Thorax.* Viscera healthy.

Case LXV.

James Gannicott, æt. 8. Duration and progress of disease unknown; abdomen tender; lips and tongue sordid; bowels purged; comatose; pupils dilated, but sensible to light; expression of eyes dull and vacant; pulse 125.

2d day after admission. Abdomen no longer tender; three stools; insensibility continues; frequent screaming; pulse 116.

3d. Perfectly insensible; all nourishment refused; stools and urine in bed; pulse 120. Died next morning.

Abdomen. Peritoneal coat of ilium vascular; its mucous coat contained numerous ulcers which varied much in size; but all of them were raised above the surface and defined and regular in their margins; mucous glands throughout the entire intestine diseased, and many of them in different stages of disease; some were only enlarged; others enlarged and inflamed; others ulcerated at the apex; others ulcerated throughout; so that the largest ulcers appeared to be diseased glands in the last stage of ulceration; mesenteric glands prodigiously enlarged and hung over the abdominal vessels like a bunch of grapes of the largest size; rest of the intestines healthy excepting that they were much contracted and intussuscepted in several parts. *Head.* Dura mater adherent with preternatural firmness to the skull; vascular; pia mater highly vascular; substance of brain vascular and firm; slight effusion between the membranes. *Thorax.* [Pluræ of right side adherent;] substance of both lungs healthy.

Case LXVI.

Henry Todd, æt. 18. Duration and progress of disease unknown; abdomen tender on pressure: tongue coated with dirty yellow crust, red at tip; perfectly insensible; delirium; eyes glistening; pulse 120, feeble.

2d day after admission. Little change excepting

that the coma is more deep; abdomen less tender; two stools; pulse 124.

3d. Coma undiminished; respiration short, hurried, rattling; stools in bed; pulse 132; great prostration.

4th. Died.

Abdomen. Mucous membrane of ilium inflamed throughout; lower part of it ulcerated; other viscera healthy. *Head.* Membranes and substance of brain vascular. *Thorax.* Mucous membrane of bronchi inflamed; bronchial tubes filled with mucus mixed with pus.

Case LXVII.

Frederick Kilham, æt. 12. Admitted on the 15th day of fever; abdomen tender; tongue not to be seen on account of its being covered with grumous blood from a large ulcer on the right side of the lower jaw; bowels bound; some pain of head; no uneasiness of chest; pulse 114; much emaciation.

16th. Lips and teeth sordid; mind confused; prostration.

20th. Violent delirium; pulse 92.

21st. The ulcer along the lower jaw in the inside of the mouth sloughing and extending; delirium; pulse 96, weak. Died next day.

Abdomen. Mucous membrane of ilium vascular,

and contained some ulcers; other viscera healthy. *Head.* More fluid than natural between the membranes. *Thorax.* Viscera healthy.

Two ulcers in the substance of the cheeks; that on left cheek extended from the angle of the mouth to the last molares, and contained a large black slough a quarter of an inch thick; this ulcer had extended to both gums, denuding the alveolar processes and loosening the teeth; that on the right cheek precisely similar, but less extensive.

Case LXVIII.

Ann Mount, æt. 28, servant. Admitted on 15th day of disease; epigastrium tender; tongue brown and dry; bowels purged; slight pain of head; much vertigo; some cough; pulse 111, very intermittent in the right wrist; less so on the left.

16th. Early this morning attacked with severe pain of the chest and dyspnœa, attended with much head-ache, for which she has been bled with the removal of the symptoms; pain now quite gone; tongue white; four stools; pulse 120, soft; blood buffy and cupped.

17th. Seized last evening with violent delirium which required restraint; occasional sleep with paroxysms of delirium; face flushed; abdomen not tender; pulse 120, firm. V.S. ad ℥xvi.

18th. No pain of head; no delirium; slept bet-

ter; tongue brown and dry; five stools; pulse 132, firm; blood sizy and deeply cupped. V.S. ad ℥xij.

19th. Complains of "stupid pain of head;" no vertigo; delirium, but less violent; scarcely any sleep; countenance still heavy, but rather more animated than yesterday; abdomen not tender; three stools in bed; pulse 132, firm but soft. C. C. ad ℥xij. nuchæ.

20th. Pain gone; more insensible; countenance more dull and heavy; scarcely any sleep; almost constant moaning; tenderness of abdomen quite gone; tongue brown and dry; lips and teeth sordid; four stools in bed; pulse 144, weak. Vini Albi, ℥ii. Mist. Camph. Fort. 6ta. q. h.

Slept rather better; less moaning; countenance scarcely as collapsed as yesterday; pulse 132, firmer; stools in bed. Augeat. Vinum ad ℥vi.

22d. Scarcely any sleep; almost constant moaning; face flushed; skin covered with cold perspiration; tongue scarcely to be protruded; deglutition difficult; subsultus tendinum; pulse 132.

24th. No change except that the prostration continued to increase. Died.

Abdomen. Mucous membrane of jejunum, ilium and cæcum highly vascular; that of ilium contained three or four large oval ulcers; other viscera healthy. *Head.* Membranes and substance of brain vascular; more serum than natural in the ventricles. *Thorax.* Viscera healthy.

Case LXIX.

Ann Martin, æt. 37, servant. Admitted on the 8th day of fever; complaint came on with ordinary symptoms, attended with nausea and vomiting; at present abdomen not tender; tongue red, cracked and dry; bowels regular; no uneasiness of chest; slight cough with scanty expectoration; pulse 92, very intermittent, beating thrice regularly, then intermitting for a space equal to that of the three pulsations; pain of head gone; some vertigo remains.

9th. Cough with difficult expectoration; respiration hurried; five stools; pulse 104, more regular.

10th. Tongue more fissured; five stools; respiration less hurried and difficult; pulse 112. Two grains of tartar emetic in solution every two hours.

11th. No material change; pulse 116; has taken ten draughts with the tartar emetic, the last four vomited. The draughts to be continued every three hours.

12th. Bronchial affection very much relieved; last four draughts not vomited. Pt. Haustus 4ta. q. h.

13th. Respiration nearly natural; much less cough; pulse 96; tongue moist; four stools, last tinged with blood; abdomen not tender. Tartar emetic omitted on account of appearance of blood in the stools.

17th. Bronchial affection appears to be quite gone; yet the tongue has again become dry; the pulse has risen to 112; there is scarcely any sleep; and slight muscular tremor is perceptible. Capiat. Vin. Alb. ℥iv. Jus. Bov. i ℔.

20th. Respiration again short and hurried; face quite dusky; tongue furred, dry and cracked; pulse 110.

23d. Respiration laborious; cough returned with very copious muco-purulent expectoration, amounting to a pint in the twenty-four hours; pulse 116.

26th. No change; a grain of tartar emetic resumed every four hours. Wine and beef tea to be continued.

28th. Neither vomiting nor purging; respiration more easy; cough diminished; tongue more moist; pulse 116.

29th. Respiration much more natural; cough greatly diminished; tongue clean and moist; pulse 112.

36th. From the period of last report she steadily and progressively improved and became convalescent; on the morning of this day while speaking to the nurse in her usual manner she suddenly fell back and expired.

Abdomen. Mucous membrane of intestines in general inflamed, especially that of ilium and cæcum, which contained some ulcers; peritoneal covering of posterior surface of spleen cartilaginous; other viscera healthy. *Thorax.* Mucous membrane of

bronchi highly inflamed; bronchial tubes full of purulent fluid; substance of lungs healthy. *Head.* Unfortunately, from some accident, the head was not examined.

Case LXX.

Stephen Winter, æt. 78. Duration and previous symptoms of disease unknown; at present abdomen tender; tongue brown and dry; stools natural; respiration wheezing with some cough; slight pain of head; mind composed; muscular tremor; pulse 100, irregular.

2d day after admission. Abdominal and thoracic symptoms the same; mind more confused; more muscular tremor; pulse 108.

5th. Respiration laborious; mind quite unconscious; constant incoherent talking; pulse 108.

6th. Respiration hurried and laborious; pulse not to be counted; perfectly insensible. Died next morning.

Abdomen. All the coats of the stomach appeared much attenuated; colon contracted into the form of a white cord; its coats in several places thickened, and its mucous membrane ulcerated; liver soft; [gall bladder much thickened, and its cavity so diminished, that it would scarcely admit the end of the finger, filled with two small gall-stones. About five inches of the recti muscles black and infiltrated with blood.] *Head.* Arachnoid thickened and opake;

considerable effusion between it and the dura mater; substance of brain firm; ventricles distended with serum. *Thorax.* All the viscera healthy, [excepting that the coronary arteries were ossified.]

Case LXXI.

Rirhard Harvey, æt. 19, butcher. Admitted on the 8th day of disease; no account to be obtained of previous symptoms; at present abdomen tender; bowels purged; tongue brown and dry; lips and teeth sordid; pain of head gone; mind confused; delirium requiring restraint; subsultus; pulse 116, weak.

9th. Tenderness of abdomen continues; stools in bed; no sleep; much delirium; scarcely conscious when spoken to; pulse 108, more firm.

10th. Slept better; rather more sensible this morning; pulse again 116.

14th. All nourishment refused; stools and urine in bed; delirium; muscular tremor; pulse 128, weak; extremities cold.

15th. Passed a better night; more sensible; pulse 116.

17th. Extensive slough on sacrum; slough also on right elbow-joint, with erysipelas of surrounding integuments; pulse 108.

21st. Skin covered with petechiæ; slough extending; great prostration.

35th. No change, excepting that the sloughs were improved in appearance by the chlorate of lime, but the emaciation increased, the strength diminished, and all nourishment was refused excepting wine. Died following day.

Abdomen. Both small and large intestines vascular throughout; mucous membrane of ilium contained several ulcers of considerable magnitude; gall-bladder contained an ounce and half of serous fluid; spleen indurated; other viscera healthy. *Head.* Substance of brain vascular; effusion between the membranes; more fluid than natural in the ventricles and at base. *Thorax.* Bronchi natural; substance of right lung gorged with blood and infiltrated with serum; that of left healthy.

Case LXXII.

Elizabeth Gore, æt. 24, servant. Admitted on 22d day of fever: attack commenced with ordinary symptoms, accompanied with sense of nausea and some vomiting. At present abdomen not tender; tongue red, moist; lips and teeth sordid; bowels bound; pain of head gone; that of loins remains; deafness; no uneasiness of chest; much cough; skin dusky; pulse 120, weak and intermittent.

23d. Abdomen tender; four stools, dark; some pain of head; delirium; pulse the same.

26th. Stools in bed; no sleep; delirium; respi-

ration hurried and noisy; cheek dusky; extremities cold.

27th. Deglutition difficult; pulse 128. Died next morning.

Abdomen. Mucous membrane of ilium ulcerated; mesenteric gland excessively enlarged. *Head.* Membrane and substance of the brain natural; much effusion into the ventricles, and at the base of the skull. *Thorax.* Viscera of the thorax in other respects perfectly healthy.

Case LXXIII.

Ann Kensit, æt 20, servant. Admitted on the 8th day of relapse: perfectly insensible; cannot be roused; no sensation on firmest pressure over the abdomen; pupils natural; tongue brown and dry; bowels loose; pulse 124.

9th. Some uneasiness induced by firm pressure over the abdomen, which has become swollen, tense, and tympanitic; tongue not to be protruded; lips and teeth sordid; stools in bed; respiration slow and laborious; face cadaverous; extremities blue.

11th. No change; has never spoken nor shown any degree of sensibility since admission.

Abdomen. Peritoneal coat of intestines in general vascular, that of small intestines particularly so; numerous patches of the mucous membrane of the ilium raised by matter deposited beneath it, and

extensively ulcerated; mesenteric glands much enlarged. *Head.* Membranes of brain vascular. *Thorax.* [Pleuræ of both sides adherent; that of right side vascular; right cavity contained some serous fluid mixed with flakes of lymph.]

Case LXXIV.

Sarah Hassell, æt. 40. Admitted on 8th day of fever; complaint commenced with usual symptoms, accompanied with much nausea. Abdomen not tender; tongue furred at root, red and clean at tip and around edges; bowels purged from the very commencement of the attack; no uneasiness of chest; cough; pain of head gone; that of back remains; vertigo; pulse 108, feeble.

9th. No tenderness of abdomen on firmest pressure; tongue brown and dry; four stools; pulse 108.

12th. Still no tenderness of abdomen; six stools; tongue quite dry; pulse 120.

16th. Abdominal symptoms unchanged, excepting that the tongue has been exceeding dry; nearly insensible; delirium; almost constant moaning; pulse 120, very weak.

25th. Abdominal and cerebral symptoms continue with little change; cough more frequent with mucopurulent expectoration; pulse 130, very weak.

29th. Quite helpless; pulse scarcely to be distinguished; copious expectoration of purulent matter.

31st. Died.

Abdomen. Ilium contained several large ulcers, especially at its termination in cæcum; liver enlarged and softened; other viscera healthy. *Head.* Membranes vascular; arachnoid opake and thickened; substance of brain vascular; effusion between the membranes; more fluid than natural in ventricles. *Thorax.* Lungs gorged; mucous membrane of bronchi vascular; bronchial tubes full of mucus mixed with pus.

Case LXXV.

Edward Hammond, æt. 24, servant. Admitted on the 22d day of fever: attack commenced with usual symptoms, accompanied with loss of appetite and sense of nausea; at present no tenderness of abdomen; tongue red, glazed and cracked; bowels purged; no uneasiness in chest; cough with mucous expectoration; pain of head entirely gone; sensation in general diminished; mind composed; little sleep; pulse 110, of good power but easily compressed; much prostration.

23d. No pain acknowledged in any organ; little sensibility; no sleep; much restlessness; delirium; expression of countenance wild; pulse 108, firm.

24th. No pain; less sensible; tongue has become brown and dry; three stools; pulse 124, weak.

25th. More sleep; more tranquil this morning; tongue also is more moist; but the stools have been passed in bed, and the pulse is 124, weak and fluttering.

26th. More sleep; much more tranquil; more sensible; tongue more clean and moist; stools not passed in bed; the pulse notwithstanding is 136, and the pulsations are not distinct, but run into each other.

28th. Mind distinct; more sleep; tongue continues more moist, but no stools and no urine have been passed; the latter has been drawn off by the catheter; pain is now complained of in the right lumbar region; pulse 123. Died next day.

Abdomen. Mucous membrane of ilium ulcerated; pancreas indurated, nearly of the consistence of cartilage, and of paler colour than natural; other viscera healthy. *Head.* Membranes natural; half an ounce of fluid at the base of the skull; substance of brain much softened. *Thorax.* Viscera healthy.

Case X.

Sarah Raven, æt. 17. For symptoms see page 152.

Abdomen. Mucous membrane of small intestines in general inflamed; lower part of ilium extremely ulcerated. *Head.* Both dura and pia mater vascular; arachnoid opake; much serum effused between

the membranes. *Thorax.* [Pleuræ of both sides adherent; left lung inflamed;] right lung healthy; other viscera healthy.

Case LXXVI.

Mary M'Gowan, æt. 18, servant. Admitted on the 8th day of fever; attack commenced with usual symptoms; at present, abdomen tender; tongue thickly coated and dry; lips and teeth sordid; much thirst; bowels purged; stools dark and offensive; pain of head which has been severe from the beginning continues, and is most severe over the forepart; pulse 116, weak.

9th. Abdomen and tongue the same; pain of head unabated; eyes dull and heavy; right cheek deeply flushed; pulse 110. C.C. ad ℥x. temporibus.

10th. Abdominal symptoms unchanged; pain of head relieved, but not gone; pulse 132, weak.

11th. Tongue cleaning; quite moist; three stools; very slight pain of head; delirium; pulse 120, weak.

12th. Pain of head quite gone; but there is no other change.

13th. No sleep; great restlessness; noisy delirium; pulse 126, weak; swelling, redness and pain of left parotid.

15th. Tongue has become brown and dry; and

respiration difficult and rattling; face flushed; colour dusky; lies on back quite prostrate; pulse 136, weak; inflammation of left parotid subsided, but it has now attacked the right.

16th. Respiration hurried and noisy; skin in general dusky; cheeks extremely flushed and of deep purple colour; pulse scarcely to be counted; prostration extreme. Died next day.

Abdomen. Peritoneal coat of intestines vascular; several ulcers in ilium and cæcum; appearance of ulcers peculiar, resembling those of phthisis rather than those of fever; vermiform process externally vascular; internally contained a crop of bodies like tubercles or enlarged glands and so numerous as to form a layer under the mucous membrane. *Head.* Membranes and substance of brain vascular; more fluid than natural in the ventricles. *Thorax.* [Pleuræ of left side adherent;] other viscera healthy.

Case LXXVII.

William Waller, æt. 24, barge builder, admitted on 22d day of fever. No tenderness of abdomen on firmest pressure; tongue loaded and dry; thirst; bowels said to be regular; no uneasiness of chest; some cough; pain of head, which had been severe, entirely gone; mind dull and confused; no sleep; face flushed; prostration; great sense of oppression; pulse 114, tremulous and indistinct.

23d. No change, excepting that the tongue has become brown and dry.

24th. Pulse 120, weaker and more tremulous: other symptoms the same.

27th. Tongue has become extremely dry; thirst urgent; three stools, mixed with blood; abdomen not tender; pulse 100.

28th. After yesterday's visit, seized suddenly with violent delirium, urgent dyspnœa, and copious discharge of blood from the bowels; these symptoms continued until half past eleven, p. m. when he expired.

Abdomen. Mucous membrane of greater part of small intestines much inflamed; that in lower part of ilium quite black and nearly sphacelated, containing several spreading ulcers; colon throughout of darker colour than natural; mucous membrane of rectum highly vascular; spleen enlarged and softened; [bladder thickened and vascular.] *Head.* Arachnoid opake and milky, covering a large quantity of gelatinous fluid. *Thorax.* [Pleuræ of left side generally adherent, of right less extensively adherent;] substance of both lungs healthy.

Case LXXVIII.

Margaret Pennifold, æt. 20, servant. Admitted on the 8th day of fever, which, besides the ordinary symptoms, commenced with pain and tenderness of

bowels: at present, abdomen tender, especially the epigastrium; tongue very red, sore, and cracked; lips and teeth sordid; much thirst; some uneasiness of chest on full inspiration; slight cough; some pain of head, especially in occiput; scarcely any sleep; mind much confused during the night, scarcely distinct during the day; pulse 105.

9th. No pain; tongue the same; three stools; slept some; mind more distinct; pulse 100.

11th. No pain; some cough; face flushed; colour of cheek dusky; voice hoarse.

12th. Little change; pulse 108.

15th. Still says she is free from pain; no tenderness of abdomen on firm pressure; tongue very red and dry; four stools, mixed with a large proportion of blood; rather more cough; sleeps well; pulse 116.

16th. Stools mixed with blood; pulse 117.

17th. Three stools, dark and offensive but without blood; pulse 100; other symptoms the same.

19th. Stools in bed; much prostration; pulse 120, very weak; respiration difficult.

20th. Vomiting; pulse 120, weaker.

21st. Vomiting continues; six stools; mind confused: pulse 120.

22d. Vomiting has ceased; deglutition difficult; face collapsed and cadaverous; five stools in bed; great prostration; pulse 117, extremely weak. Died in the night.

Abdomen. Mucous membrane of pyloric end of stomach and of intestines in general vascular; that of jejunum and ilium very nearly black, presenting the appearance of extensive ecchymosis; ilium contained an infinity of elongated ulcers, many of which had penetrated the muscular coat; the cæcum and the lower part of the colon in a similar condition; there was no deposition of adventitious matter; but the ulcers were formed entirely in the coats of the intestine; other viscera healthy. *Thorax.* Mucous membrane of both bronchi inflamed; bronchial tubes full of mucus; mucous membrane of larynx perfectly healthy, and without the least thickening in any part; [apex of left lung adherent to costal pleura; adhering part of the substance of the lung contained a mass of tubercles, some of which were passing into the state of suppuration; the remainder of the lung more vascular than natural, and some parts of it hepatized; right lung less consolidated, but still more firm and vascular than natural. *Head.* Brain and its membranes tolerably healthy.

Case LXXIX.

Thomas Bryan, æt. 18, labourer. Admitted on the 8th day of fever: at present pain of abdomen, much increased on pressure; tongue white and moist; much thirst; bowels loose; pain in right side on

full inspiration; some cough; pain of head and back, which had been severe, gone; pulse 90.

9th. A few hours after the visit, the pain in the side became exceedingly severe and was attended with frequent cough. On account of these symptoms he was bled to the extent of twenty-four ounces, with immediate and great relief: the pectoral symptoms have not returned; abdomen still tender; five stools, dark; no pain of head, but the skin over the scalp is hot, and there is some intolerance of light; pulse 112. Takes a grain and half of calomel, with two of Dover's powder, every six hours.

10th. Pain of abdomen continues; vomiting; two stools; pulse 116.

13th. Gums already affected; throat sore; none of the symptoms relieved; tongue has become brown and dry; five stools; less sensible; much moaning; pulse 120.

14th. Abdominal symptoms undiminished; five stools; more insensible; pulse 112.

16th. Insensibility increased to coma; little change in the other symptoms.

20th. Severe pain in the abdomen, particularly in the region of the cæcum; tongue brown and dry and quite hard; four stools; pulse 118.

23d. Vomits food and medicine; coma continues; delirium; pulse 118.

24th. No change, excepting that the vomiting

ceased, after having taken a scruple of calomel at a single dose.

26th. Died.

Abdomen. Ilium and cæcum much and extensively ulcerated; other viscera healthy. *Head.* Membrane of brain natural; substance vascular; more serum than natural in the ventricle; some at the base; much fluid in the theca vertebralis. *Thorax.* Posterior part of left lung tuberculated, and infiltrated with purulent matter; upper part of right lung still more tuberculated and condensed.

Case LXXX.

Elizabeth Hammond, æt. 50, married. Admitted on the 28th day of fever, which came on with the ordinary symptoms; at present she is without pain in any organ; face peculiarly pallid; some cough; pulse 120, and weak.

29th. No tenderness of abdomen; no pain; cough; delirium; pulse 110.

32d. Cough; delirium; pain, redness, swelling, and vesication of left leg; pulse 120, weak.

35th. Tongue scarcely to be protruded; very tremulous; three stools; cough; much delirium; pulse 120, very weak; the vena saphena major easily to be traced along its whole course, being hard, tense, and painful.

40th. Delirium; muscular tremor; much convul-

sive twitching of the face; pulse 130, extremely weak.

40th. Delirium continues; muscular tremor increased; great prostration; leg more swollen, the tumefaction now extending up the thigh; the saphena traced to the middle of the thigh where it ends in a varix, which has for the last two days greatly enlarged; lymphatics along the course of the vein swollen; integuments of a dusky red colour; much thickening and hardening of the cellular tissue over the femoral vessels; says she has no pain in the leg; mind dull and confused, yet answers coherently when spoken to.

43d. Delirium continues; prostration increases; lips and teeth covered with dark-coloured sordes; affected leg darker in colour, and colder to the touch; pulse 120; no tenderness of the abdomen, nor has it been tender through the whole course of the disease.

44th. Died.

Abdomen. Mucous membrane of ilium, cæcum, and commencement of colon extensively ulcerated; viscera of head and thorax healthy; slight swelling of the whole left extremity; ankle œdematous; the cellular tissue along the entire course of the saphena major and femoral vein exceedingly condensed and hard; on opening the saphena vein there was found a layer of coagulable lymph lining its whole internal surface, which was universally vascular and rough;

in many places, especially about the knee, the coats of the vein were very much thickened, so that the calibre of the vessel was diminished at least one-half its size; the lower part of the femoral vein was in a similar state, but its superior portion and the external iliac were little, if at all affected.

Case LXXXI.

Mary Ford, æt. 30, married. Admitted on the 8th day of fever, which in addition to the ordinary symptoms, was attended at the commencement with pain in the abdomen, which continued for some time, but which is now entirely gone: states that the bowels have been very loose for upwards of a month past; tongue loaded and red; thirst; no uneasiness of chest; some cough; pain of head, which was severe in the commencement, quite gone; pulse 90; great prostration.

9th. No pain in any organ; tongue unchanged; two stools, light and offensive; delirium.

10th. Four stools in bed; delirium; lies on back quite prostrate; pulse 105, weak.

11th. Tongue not to be protruded; perfectly insensible; pulse 125.

Abdomen. Peritoneal coat of small intestines vascular; mucous membrane of ilium and cæcum contained several large ulcers; in other places the membrane was entire, but irregularly raised by sub-

mucous deposit so as to present the appearance of large ulcers. *Head.* Arachnoid highly vascular; effusion beneath all the membranes; more fluid than natural in the lateral ventricles. *Thorax.* Viscera healthy.

Case LXXXII.

Eleanor Norris, æt. 12. Was seized eight days ago with sudden loss of strength, great confusion of mind, and severe pain in the head and limbs; the pain of the head continues, shooting down along the spinal cord to the loins; no tenderness of abdomen; tongue white; bowels purged; pulse 129, of good power.

9th. Tongue has become brown and dry; five stools; scarcely any pain of head; delirium; pulse 120.

14th. Abdomen now tender on pressure; tongue continues brown and dry; four stools; pain of back and loins returned; delirium; pulse 130.

15th. Pain of abdomen continues; tongue still browner and more dry; four stools; delirium; pulse 128.

16th. Deglutition difficult; pulse 120; great prostration.

17th. Stools in bed; delirium and prostration increasing; pulse scarcely to be counted.

18th. Great restlessness; much delirium; counte-

nance wild and anxious; pulse exceedingly quick and weak.

20th. Respiration hurried and laborious; pulse not to be counted; insensible; stools in bed. Died in the night.

Abdomen. Mucous membrane of jejunum and ilium extremely ulcerated; omentum a mere web; all the other viscera healthy. *Head.* Membranes and substance of brain apparently natural. *Thorax.* [Costal pleura of left side inflamed and thickened; pulmonary pleura covered with pus; pleural sac contained two ounces and a half of serum mixed with pus; substance of left lung nearly healthy; right side healthy; two ounces of serum in pericardium.]

Case LXXXIII.

Maria Moore, æt. 22, servant. Admitted on the 22d day of scarlet fever: throat well; deglutition easy; no pain of chest; none of abdomen; tongue of dark red colour; bowels purged; some pain of head, especially at occiput; pulse 98.

23d. Pain of head continues; noisy delirium; pulse 108; abdominal symptoms the same.

30th. Amended the day following last report, and continued to improve until this morning, when she was again attacked with soreness of throat and difficult deglutition; tongue loaded; three stools; pulse 98.

31st. Throat equally painful; deglutition equally difficult; pulse 110.

32d. After the application of leeches to the throat the pain became easier and the deglutition less difficult; internal fauces very red; uvula much swollen.

33d. Throat again better; deglutition easy; pulse 120.

35th. Throat well, but the voice is hoarse; four stools, mixed with blood; pulse 110.

36th. Respiration hurried; tongue brown, dry, and cracked; lips and teeth sordid; four stools, mixed with lumps of coagulated blood, partly passed in bed. Died in evening.

Abdomen. Mucous membrane of ilium and cæcum in part highly vascular and much thickened, in part ulcerated; pancreas indurated; other viscera healthy. *Thorax.* Epiglottis vascular and thickened; mucous membrane of arytænoid cartilages ulcerated; mucous membrane of trachea highly vascular; [pleuræ of both sides adherent; right lung filled with tubercles; bronchial glands enlarged.] *Head.* Not examined.

Case LXXXIV.

Charles Crossley, æt. 21. Admitted on the 15th day of fever, which came on with the ordinary symptoms: at present, tenderness of the epigastrium, and over the whole abdomen; tongue brown, cracked and tremulous; bowels purged; scarcely any pain

of head; mind indistinct; expression of eyes wild; slight cough; pulse 40, soft.

16th. After six leeches had been applied to the epigastrium the tenderness was much diminished: says he has now no pain any where; two stools; expression of countenance the same; pulse 96.

17th. Abdomen has become swollen and hard, not tender on firm pressure; five stools; tongue unchanged; respiration hurried and noisy; no sleep; delirium; face pallid; eyes wild and rolling; pulse 100.

18th. Abdomen hard, especially in hepatic region; slightly tender; vomiting; two stools, mixed with blood; extremities cold.

19th. Abdomen hard, not tender; two copious stools, consisting almost entirely of blood; tongue the same; pulse 96.

20th. One stool without any feculent matter, consisting entirely of blood; delirium; muscular tremor.

23d. No stool for two days; having taken two drachms of castor oil, he had two copious evacuations of very dark colour, mixed with blood; abdomen more soft, not tender; tongue cracked in the centre, more clean and moist at edges: cough; pulse 108, soft.

35th. From the morning of last report the hæmorrhage disappeared, sleep and sensibility returned, the tongue became more clean and moist, the strength improved, the appetite became keen: he was put

upon low diet, and was allowed three ounces of meat daily and four ounces of wine: he appeared to be so much recovered, that it was thought he could bear this liberal allowance; but, immediately on this change of diet, the skin became hot, the cough returned, he had six stools without medicine, the delirium re-appeared at night, and the pulse rose to 100; there was not the slightest pain, either of the head or of the abdomen.

36th. Tongue again brown and dry; three stools; no sleep; much restlessness; delirium; pulse 108, firm; skin extremely hot.

43d. Stools and urine in bed; delirium; muscular tremor; subsultus tendinum; pulse 104.

46th. Sloughs have formed on both hips and an abscess in the right groin.

49th. Abdomen has become swollen, tense, and tympanitic; no stool; tongue the same; vomits every thing; a large black eschar on sacrum; much discharge from the ulcer in the groin; cough frequent; pulse 120, feeble; extreme prostration. Died in the evening.

Abdomen. Lower portion of ilium and commencement of cæcum contained several ulcers, some of which were of large size; [peritoneal cavity contained two pints of serum, mixed with pus and flakes of lymph; intestines, liver, and abdominal parietes lined throughout with a coat of lymph, easily removeable with the scalpel; intestines adherent to

each other and to the parietes of the abdomen.] *Head.* Arachnoid opake and of milky colour; pia mater highly vascular; much effusion beneath it and the arachnoid; several drachms of serum in the ventricles, and a large quantity at the base of the skull; substance of the brain highly vascular and much softened. *Thorax.* [In each cavity of pleura about six ounces of fluid; posterior part of lungs condensed; a few recent adhesions between the pleuræ of the right side;] other viscera healthy.

Case LXXXV.

Mary Baker, æt. 23, servant. Admitted on the 22d day of fever, which, in addition to the ordinary symptoms, came on with nausea, anorexia and purging; at present complains of a sense of heat in the abdomen without pain; but there is uneasiness when firmly pressed; tongue white in middle, red at edges, moist; thirst; bowels stated to be regular; pulse 104; no pain of chest or head.

23d. Abdominal symptoms the same; no sleep; some pain of head; pulse 120, weak; much sense of weakness.

24th. Tongue has become dry; three stools; pain of head gone; some vertigo; delirium; expression of countenance anxious and sunk; pulse 120.

25th. Tongue more moist; three stools; slept better; expression of countenance more natural; but the pulse has risen to 130 and is extremely weak.

26th. More pain of abdomen on pressure; more prostration; delirium continues; pulse 130, extremely weak. Died next day.

Abdomen. Peritoneal coat of small intestines highly vascular; mucous membrane of lower part of ilium and cæcum full of ulcers, some of which had penetrated through the muscular to the peritoneal coat; this latter membrane was very dark and approaching to gangrene; peritoneal cavity contained a considerable quantity of bloody serum; omentum dark and inflamed; cardiac extremity of the stomach vascular; other viscera healthy. *Head.* Dura mater adherent with more firmness than natural to the skull; other membranes healthy; more fluid than natural in the ventricles; substance of brain and cerebellum vascular. *Thorax.* Mucous membrane of both bronchi highly inflamed; [left thoracic cavity obliterated by old adhesions; left lung completely hepatized; right lung loaded with blood and serum; right cavity contained a considerable quantity of blood and serum; heart flaccid; both auricular valves very dark.]

Case XI.

George English, æt. 25. For symptoms see page 153.

Abdomen. Numerous ragged ulcers in the cæcum, which, having destroyed the mucous, had laid the muscular coat quite bare; both the muscular and the peritoneal coats were blackened and in the first stage of sphacelation; an aperture of about the size of a sixpence had been formed in them through which a considerable quantity of fæces had escaped into the peritoneal cavity; in different portions of the mucous membrane of the other intestines there were slight patches of inflammation; omentum much thickened, adhering anteriorly to the abdominal peritoneum and posteriorly to the intestines; the latter were so agglutinated together, that it was impossible to trace their convolutions; the peritoneal sac contained four pints and a half of serum mixed with pus; the peritoneal coat of the liver adhered to the diaphragm all around, except at one point where a sac was formed which was filled with serum; substance of liver healthy; other viscera healthy. *Head.* Dura mater vascular; pia mater highly vascular; arachnoid healthy; more fluid than natural between the membranes and in the ventricles; substance of the brain pretty healthy. *Thorax.* [Right pleura vascular; superior and middle lobes of right lung contained numerous miliary tuber-

cles; lower lobe, one or two in the first stage of suppuration; the under surface of this lobe adhered to the diaphragm with great firmness, showing that the disease of the abdomen had extended to the thorax; pleuræ of left side contained two ounces of bloody serum; substance of left lung healthy; pericardium contained three ounces and a half of serum; left ventricle of heart full three-fourths of an inch thick.]

Case LXXXVI.

William Baker, æt. 26. Admitted on 15th day of fever: no account to be obtained of previous symptoms: too insensible to give any statement that can be depended on of his present feelings; points to lower part of chest and epigastrium as the chief seat of pain; abdomen tender on pressure; some cough; voice hoarse, husky, and feeble; no pain of head; pupils contracted; pulse 100, sharp.

16th. Six stools, two passed in bed; hiccup; frequent cough; respiration laborious; pulse 84.

20th. No perceptible change until to-day, when the stools, six in number, became mixed with blood; the expectoration is also tinged with blood; respiration more hurried and difficult; hiccup continues; pulse 120.

23d. Five stools in bed; hiccup gone; no sleep; great restlessness; pulse the same. Died next morning.

Abdomen. Peritoneal coat of intestines vascular; mucous membrane of small intestines, and especially of ilium, inflamed and ulcerated; near the caput coli a large ulcer had perforated the peritoneal coat, and through the opening, which was an inch and a half in diameter, a quantity of fæculent matter had escaped into the cavity of the peritoneum; spleen very much softened, easily breaking down under the finger. *Head.* Pia mater highly vascular; substance of brain slightly vascular; a small quantity of bloody serum effused into the lateral ventricles. *Thorax.* Mucous membrane of bronchi of dark red colour; tubes contained much frothy mucus; substance of both lungs gorged; [pleuræ of left side contained a pint and a half of fluid; pericardium adherent to the pleura costalis; heart flaccid and pale.]

Case LXXXVII.

Thomas Kennie, æt. 30, labourer. Admitted on 10th day of fever: attack commenced, besides the ordinary symptoms, with tenderness of abdomen: at present the abdomen, which is generally tender, is exceedingly so over the right iliac region; bowels stated to be regular; tongue foul, red and dry; thirst; some pain of chest on full inspiration and coughing; cough troublesome; respiration hurried;

little sleep; mind confused; face flushed; pulse 120, weak.

11th. Tenderness of abdomen continues; five stools; respiration hurried, with occasional cough and viscid expectoration; slight pain of head; mind distinct; eyes suffused; skin cool, covered with petechiæ. Died next day.

Abdomen. Mucous membrane of small intestines very vascular, that of ilium intensely so; contained several oval and deep ulcers, one of which had perforated the peritoneum, the aperture of which was sufficiently large to allow the apex of the ring finger to pass through it; the peritoneal cavity contained about a pint of pus; the intestines were all glued together; the surface of the liver was very dark and much inflamed. *Head.* Membranes of brain vascular; substance rather vascular; more fluid than natural in the ventricles. *Thorax.* Viscera healthy.

Case LXXXVIII.

David Piggott, æt. 19, furrier. Admitted on the 9th day of fever: at present, severe pain in the right hypochondrium, stretching towards the umbilicus, increased on pressure; tongue brown and dry; no stool; slight cough; some pain of head; eyes suffused; pulse 108, firm. V.S. ad ℥x.

10th. Pain of right hypochondrium gone; tongue

the same; no pain of head; very deaf; slept tolerably; pulse 100, soft.

11th. No pain; tongue unchanged; one copious stool, consisting chiefly of blood; slept well; mind confused; countenance rather improved; pulse 96.

12th. No pain; two stools, with less admixture of blood; mind distinct; pulse 110.

13th. Eight stools, scanty, without blood; tongue dry and furred; slept ill; great prostration; pulse 90. Died next day.

Abdomen. Mucous membrane of small intestines in general vascular, especially that of the ilium and commencement of the colon, in both of which were numerous ulcerations; one in the former had perforated the bowel, forming a hole of the size of a sixpence; about a quart of sero-purulent fluid in the peritoneal cavity; the intestines were glued together, and their peritoneal coat generally inflamed. *Head.* Membranes of brain vascular; substance natural. *Thorax.* Viscera healthy.

Case LXXXIX.

William Spoull, æt. 23, baker. Admitted on the 22d day of fever: no pain or tenderness of abdomen; tongue red and dry; bowels loose; no pain of chest; some cough; no pain of head; some of limbs and back; mind distinct; little sleep; very deaf; pulse 102.

25th. Tongue much furred and fissured; four stools; cough the same; pulse 108.

26th. Four stools, mixed with blood; respiration hurried.

27th Tongue more clean, slightly aphthous; three stools without blood; respiration less hurried; pulse 104.

29th. Severe pain of abdomen, from which he had hitherto been quite free, came on during the night; at present it continues very severe, is much increased on pressure; abdomen swollen and tense; four stools without blood; pulse, 112 sharp.

30th. Pain of abdomen not so severe, but still excited by full pressure; vomited a large quantity of bilious fluid; two stools, dark and slimy; respiration hurried; countenance sharp and anxious; pulse 124, small. Died two hours after visit.

Abdomen. The mucous membrane, both of the small and large intestines, in general highly inflamed; the lower third of the ilium, the cæcum and the colon were full of ulcers, one of which, in the ilium, had perforated through all the coats of the intestine, and formed, near the ileo-cæcal valve, a large circular opening, of the size of a crown piece, through which the contents of the bowel had escaped into the cavity of the peritoneum; this cavity contained a large quantity of sero-purulent fluid, mixed with feculent matter; the convolutions of the intestines were glued together and their peritoneal

coat every where highly inflamed; the spleen, liver, and pancreas were sound. *Head.* The brain and its membranes were healthy. *Thorax.* Viscera healthy.

The attentive student of the important and instructive cases included under this section will have perceived that, in the order in which they stand, they exhibit a complete series of changes in the intestines from the slightest vascularity to the most intense inflammation; and from mere elevation and inequality of the mucous membrane, in consequence of adventitious deposit beneath it, or from the simple and most superficial abrasion of its surface, to the most extensive and deep ulceration, on to the ultimate perforation of all the coats of the bowel.

When a number of cases are thus brought together and placed in juxta position it is impossible not to perceive, and indeed not to be forcibly struck with the uniformity with which a certain series of changes takes place. We do not see the same number of morbid appearances in every case, but we see in every case precisely the same morbid changes as far as they go, the difference being merely a difference in degree; so that the description of such a number of cases as has now been detailed would be tedious on account of its sameness, were it not that the fact they establish is one which it is of paramount importance to the practitioner that he should know;

and that there appears to be no other means by which it can be duly impressed upon the mind.

In like manner the uniformity of the symptoms which denote that these morbid changes are going on, is as remarkable as the regularity with which the changes themselves occur. Their great peculiarity, which it is as important to know, as it is to understand their indication itself, is *their want of prominence.* They are always to be discerned, or with extremely rare exceptions; but they seldom or never force themselves upon the notice of the careless or extort the attention of the unobserving: still they are not the less constant in their occurrence because they come without noise, nor is the indication they give of their presence less significant because it is unobtrusive. They do not announce their presence by the excitement of violent paroxysms or by inducing intense pain, because the state of the system in which they take place is incompatible with acute sensation of any kind. The prominent symptoms during life are almost always in the head; the great changes of structure found after death are always in the intestines; and this, which the pathologist learns from observation, the physiologist might have predicted from his knowledge of function. The affection of the intestines in fever is never a simple or single affection: it never occurs alone, but always in combination with an affection of the brain; and the cerebral affection is always antecedent, the intes-

tinal, invariably subsequent; while the certain consequence of the cerebral affection is a diminution, and ultimately an abolition of sensation. It is therefore quite impossible, from the very nature of the derangement that takes place in the animal economy, that the intestinal affection should ever be attended with violent pain. Occasionally, indeed, when the abdominal affection is very much in excess, and the cerebral affection is unusually slight, severe pain may be felt; but that is rare, and the total absence of pain, and even the total absence of tenderness on pressure, is more common. It is not then to the patient's own complaint of pain in the abdomen that the practitioner must trust for the discovery of abdominal affection in fever.

But though the patient seldom complain of pain in the abdomen, yet in the great majority of cases the abdomen is tender on pressure, and it is so in all, excepting when the cerebral affection is peculiarly severe or is very far advanced. These exceptions render this symptom not absolutely constant, although at the bed-side of the sick the practitioner will find it very rarely absent. The symptom which is still more constant, as the reader must have observed in the perusal of the preceding cases, and which therefore affords a very certain guide to the detection of the disease, is a loose state of the bowels. Whenever both concur there can be no doubt of the diseased process which is going on within the intes

tine: but as the tenderness may be obscured or lost from the intensity or advancement of the cerebral affection, so it is very remarkable that, in the progress of the intestinal disease, the bowels sometimes become regular and even constipated. The physician who sees the patient for the first time in this stage of the disease, can ascertain the condition of the mucous membrane of the intestines only by obtaining an accurate account of the preceding symptoms. And when it is possible to procure a distinct and complete history of the disease from its commencement, it is commonly found that nausea and vomiting were among the early symptoms, while, as we have seen, the latter is not unusually present in the more advanced stages. The result of the whole is that, excepting when the cerebral affection is most intense and overwhelming, the existence of inflammation and ulceration in the mucous membrane of the intestines in fever are denoted by signs which are quite constant, and in the fidelity of the indication of which we may repose implicit confidence. The importance of the diagnosis may perhaps plead our excuse for repeating them again. They are tenderness of the abdomen on pressure; loose stools; redness of the tongue, especially at the tip and edges, in general preceded by nausea and vomiting, and in the most exquisitely marked cases, and in their advanced stage, followed by a mixture of blood in the stools and a swollen, hard and tympanitic state of

the abdomen. All these symptoms by no means always concur in the same case: but the presence of one or two of them will be sufficient to guide the attentive observer to the knowledge of the disease.

We have seen that the appearance of blood in the stools is not very frequent: that the most extensive ulceration may and commonly does exist without it; still when blood does appear it is generally found in combination with an ulceration which is not only extensive, but which has penetrated deep into the coats of the intestine. But although this be the general fact, yet it must be borne in mind that blood may be poured out in large quantities without the existence of a single ulcer. In this case the blood issues from the capillary vessels of the mucous membrane of the intestine, and when examined after death this membrane is found to be of a dark red colour, and presents the appearance of ecchymosis.

IV. Cases in Illustration of the Morbid Changes which take place within the Head, Thorax, and Abdomen, in the same Individual; or Mixed Cases.

Case XC.

Margaret Eades, æt. 18, dress-maker. Admitted on the 22d day of fever, which attacked with the ordinary symptoms: at present the mind is

dull; the sensibility diminished; there is scarcely any sleep; the eyes injected and suffused; the skin hot; the tongue brown and dry; the pulse 120, but there is no pain in any organ.

23d. Insensibility increased to coma; delirium; tongue dry and quite black; gums bleed on the slightest touch; lips and teeth sordid; four stools, dark and offensive; pulse 110.

27th. Coma undiminished; almost constant moaning; scarcely any sleep; three stools of same character; some cough; pulse 124, feeble.

31st. All the symptoms aggravated; extreme prostration; countenance sunk; cough, without expectoration; respiration with mucous rattle; stools in bed: pulse 140, extremely feeble. Died next day.

Head. Dura mater vascular; arachnoid thickened and opake; substance of brain highly vascular, in every point thickly studded with red points; effusion between the membranes and into the ventricles. *Thorax.* Mucous membrane of bronchi inflamed; substance of lungs partly condensed and partly tuberculated. *Abdomen.* Mucous membrane of ilium inflamed and ulcerated; other viscera healthy.

Case XCI.

William Middleton, æt. 18, shoemaker. Admitted on the 5th day of scarlet fever, which commenced, in addition to the ordinary symptoms, with

exceedingly severe head-ache, which continues undiminished; scarcely any sleep; eyes red and ferrety; tongue white; bowels loose; pulse 120; eruption apparent only on the chest; no soreness of throat nor difficulty of deglutition.

6th. Pain of head nearly gone; more insensible; pulse 126; eruption fading.

8th. Insensibility increased to coma; adnatæ glistening; tongue brown and dry; lips and teeth sordid; four stools.

10th. Coma deeper; great restlessness; no sleep; stools in bed; pulse 120, weaker.

11th. Increasing restlessness; tongue not to be protruded; deglutition difficult; stools and urine in bed; pulse 150, indistinct.

13th. Died.

Head. Dura and pia mater highly vascular; arachnoid thickened and opake; substance of brain highly vascular; effusion between the membranes, into the ventricles, and at the base. *Thorax.* Mucous membrane of bronchi vascular; substance of both lungs inflamed. *Abdomen.* Mucous membrane of ilium ulcerated; other viscera healthy.

Case XCII.

Sarah Sharp, æt. 18. Admitted on the 22d day of fever: the pain of the head, which had been severe from the commencement, continues; complains

also of much pain in back and limbs; abdomen tender; tongue fiery red; bowels purged; pulse 100, soft.

23d. No change, excepting that the tongue has become brown and dry in the middle, but still remains exceedingly red at the edges; four stools; pulse 108.

32d. Pain of head quite gone; that of abdomen, which had increased, has now also disappeared; no sleep; great restlessness; delirium; eyes dull and heavy; face flushed; tongue red and dry; four stools; pulse 110.

40th. Cerebral symptoms unchanged; no cough or uneasiness of chest; skin dusky, that of the cheek of a deep purple colour; tongue loaded and dry; lips and teeth sordid; stools in bed; pulse quick and very feeble; great prostration.

48th. Coma; discharge from both ears; vomiting; pulse 120, very weak.

50th. Erysipelas of cheek, extending to scalp; much discharge from ears; tenderness of abdomen again returned; tongue again of fiery red colour; pulse extremely quick and feeble.

70th. During the whole of the period since last report there has been occasional vomiting; the erysipelas gradually disappeared; the sensibility returned; the tongue became clean and moist; the stools improved, and there was even some return of appetite: on the other hand, there came on extensive

excoriation, and at last sloughing of back and hips; the emaciation became very great, the prostration extreme, and at length, on the 86th day from the commencement of the fever, she sunk exhausted.

Head. Membranes of brain highly vascular; substance natural; upwards of eight ounces of serum in the different cavities. *Thorax.* Mucous membrane of trachea slightly reddened; bronchi vascular; lungs dark and much gorged with blood. *Abdomen.* Mucous membrane of intestines slightly vascular, [but the peritoneal coat highly inflamed, and contained on its surface a coating of coagulable lymph, which glued the convolutions of the intestines to each other and to the omentum.]

Case XCIII.

Charles England, æt. 22, servant. Admitted on the 11th day of fever: previous symptoms unknown. At present perfectly insensible; pupils contracted, insensible to light; face and lips of deep purple colour; extremities cold; full pressure induces some uneasines in abdomen; body of tongue loaded and dry, edges red; deglutition difficult; pulse 100, feeble.

12th. Some sleep through the night; more sensible to-day; no stool since admission; pulse 114.

13th. Still more sensible; complains of giddiness; five stools; tongue beginning to clean.

20th. Had been gradually improving since last report, and the pulse had fallen to 80; during last night he became extremely restless, with much delirium; mind now confused; face of a purple colour; tongue red and glossy; three stools; pulse 120.

21st. Delirium; almost constant moaning; cheeks of purple colour; tongue brown and glossy; pulse 130, but so indistinct that it can scarcely be counted; lies extremely prostrate.

22d. Erysipelas of face, extending down the neck; some cough; abdomen again tender; three copious dark-coloured stools; pulse 130. Died following day.

Head. Scalp loaded with an unusual quantity of blood; the vessels of all the membranes of the brain exceedingly turgid; a large coagulum of blood between the dura mater and the arachnoid; substance of the brain exceedingly soft; an ounce and a half of bloody fluid at the base of the skull. *Thorax.* Mucous membrane of bronchi extremely vascular; substance of lungs somewhat condensed and very much gorged; [two ounces of serum in each pleural cavity.] *Abdomen.* Mucous membrane of ilium much thickened, softened, and injected, exhibiting a few points of incipient ulceration; [mucous membrane of bladder thickened and inflamed; peritoneum lining the pelvis vascular;] other viscera healthy.

Case XCIV.

James Robinson, æt. 25. Admitted on the 8th day of relapse: at present mind confused; acknowledges no pain in head, chest, or abdomen; tongue not much loaded, moist; thirst; pulse 60, weak.

9th. No pain; some sleep; occasional delirium; two stools; pulse 78.

10th. Mind dull and heavy; returns no answer when spoken to; pulse the same.

17th. Little change until to-day; the entire body is now covered with an efflorescence, consisting of minute papulæ, of a vivid red colour; mind dull and confused; pulse 120. Died next day.

Head. An old fracture over that part of the coronal suture which joins the parietal bone, seems to have left the brain unaffected; inner surface of skull perfectly smooth; both membranes and substance of the brain highly inflamed; pituitary gland suppurated; cerebellum natural. *Thorax.* [Left lung contained many tubercles in the stage of suppuration; the apex, which was full of tubercles, adhered to costal pleura; right side healthy; pericardium contained two ounces of bloody serum; serous lining of auricles and ventricles of heart highly vascular and of dark red colour; valves of aorta and of auricles extremely dark;] no account recorded of the state of the mucous membrane of the

bronchi. *Abdomen.* Omentum vascular; intestines throughout of dark red colour; all their coats every where exceedingly softened, the peritoneal peeling off with ease from the muscular; the mucous inflamed, not ulcerated; the mucous membrane of the stomach vascular; a considelable portion of the jejunum intussuscepted; other viscera healthy.

Case XCV.

Ann Smith, æt. 23, married. Admitted on the 15th day of fever; pain of head gone; some vertigo remains; no uneasiness of chest; some cough which excites pain in the abdomen; the latter not very tender even on full pressure; tongue loaded in middle with white fur, red at edges; no stool for the last twenty-four hours; pulse 120, weak.

17th. Eruption has appeared over almost the entire skin, consisting of minute papillæ of a dusky red colour; two stools; pulse 120.

20th. Erysipelas extending over both shoulders; severe pains in the limbs.

25th. Cough troublesome with copious viscid expectoration; erysipelas extending form the shoulders to the chest; tongue dry: delirium; pulse 110, weak.

26th. Cough diminished; respiration hurried; stools in bed; pulse 120, feeble.

27th. Delirium continues; respiration more hurried; pulse extremely feeble.

28th. Erysipelas still extending; powers sinking; respiration laborious; stools and urine in bed. Died in evening.

Head. Arachnoid vascular; substance of brain vascular; sheath covering the lumbar portion of the spinal cord highly vascular; cord itself natural; effusion into the lateral ventricles; plexus choroides and velum interpositum highly vascular; pituitary gland gritty. *Thorax.* Mucous membrane of bronchi inflamed; substance of left lung intensely inflamed, being nearly as red as muscle and its lobes adherent; [corresponding side of pericardium highly vascular; right lung slightly inflamed; right pleuræ not adherent; left adherent throughout.] *Abdomen.* Patches of vascularity in mucous membrane of intestines and over their peritoneal coat; pyloric end of stomach vascular; spleen soft; other viscera healthy.

Case XCVI.

Joseph Baird, æt. 12. Admitted on the 22d day of fever; slight pain of head; severe pain across the loins; no uneasiness in chest; no cough; respirations 44; abdomen tender; tongue red, parched; bowels purged; pulse 134.

33d. Abdomen tender, tumid, tense; four stools; tongue loaded with white fur; mind distinct; scarcely any sleep; extremely fretful.

34th. No delirium; stools in bed; pulse 114. Died next day.

Head. Membranes and substance of the brain vascular; at the surface of the right posterior lobe, an abscess of considerable size, the floor of which was formed by the pia mater; gelatinous effusion between the arachnoid and the pia mater. *Thorax.* Mucous membrane of bronchi vascular; substance of lungs healthy; [left cavity of pleuræ contained eight ounces of bloody serum; right six.] *Abdomen.* Peritoneal and mucous coats of jejunum and ilium vascular; mesenteric glands greatly enlarged; several of them suppurated; [large quantity of serum mixed with pus in the peritoneal cavity; omentum much thickened; adhered to the superior portion of the spleen; to the edge of the left lobe of the liver, and to the portion of the diaphragm immediately above the spleen; in this manner it formed the external boundary of an abscess of considerable size in the substance of the spleen; portions of the sac itself ulcerated; the rest of the spleen nodulated; these nodules when cut into were found to consist chiefly of puriform matter contained in cells; thoracic duct enlarged; receptaculum chyli exceedingly enlarged and ulcerated.]

Case XCVII.

Catherine French, æt. 24. Admitted on the 9th day of scarlet fever. Complaint came on with sudden loss of strength, shivering and violent pain of head and chest: at present throat sore; deglutition difficult; some pain of chest; great tenderness of abdomen; nausea and vomiting; tongue dry, brown and cracked; slight pain of head; eyes dull, heavy and suffused; pulse 104, pretty strong; no eruption.

23. The pain of throat, the difficult deglutition, the tenderness of the abdomen had disappeared; the pulse had fallen to 90, and she appeared to be gradually recovering until this day, when, preceded by a slight return of sore throat, erysipelas appeared on the face; no pain of head; tongue again brown and dry; pulse 96.

24th. No sleep; delirium; erysipelas extending; pulse 108.

38th. Erysipelas has disappeared, but other symptoms are aggravated; extreme restlessness; much delirium; frequent cough, with scanty expectoration; tongue brown, dry and cracked; pulse 86.

39th. Respiration difficult; delirium; vomiting; pulse 120.

41st. Respiration rattling; delirium; inclined to sleep; pulse 120.

42d. Respiration increasingly difficult and painful; pulse 129.

43d. Extremely restless; almost constant moaning; countenance anxious; cough; tongue continues brown and dry; lips and teeth sordid; pulse 122.

44th. Died during the night.

Head. An abscess over the posterior extremity of the sagittal suture, around which for the space of two inches, the pericranium was destroyed, leaving this portion of the bone bare. Dura mater natural; arachnoid and pia mater vascular; substance of brain natural; effusion between dura mater and arachnoid; lateral ventricles full of serum; two ounces at base. *Thorax.* [Pleuræ of right side covered throughout with pus of very thick consistence, presenting the appearance of the interior of a large abscess, contained two pints of fluid consisting of serum, pus and blood; superior lobe of right lung hepatized and tuberculated; some of the tubercles in a state of suppuration; middle lobe contained a large abscess; lower lobe much wasted, blackened, and in many points softened down to a black fluid; left thoracic cavity contained about one pint of pure serum; pleuræ very vascular but not adherent; substance of lung perfectly sound;] condition of mucous membrane of bronchi not stated. *Abdomen.* Mucous membrane of ilium contained several ulcers; other viscera healthy.

Case XCVIII.

John Green, æt. 10. Period and progress of disease unknown: throat much inflamed and ulcerated; deglutition difficult; respiration painful; much muco-purulent fluid constantly discharged from nostrils; eyes suffused; lips and teeth sordid; tongue cannot be protruded; pulse cannot be counted; noisy delirium; several dark-coloured vesicles on hands, especially in the neighbourhood of the joints. Died the same evening.

Head. Membranes slightly vascular; arachnoid and dura mater adherent at several points; substance of brain slightly vascular; effusion into ventricles. *Thorax.* Mucous membrane of trachea and bronchi highly vascular; larynx much inflamed; arytænoid cartilages ulcerated; epiglottis dark and thickened; [pleuræ adherent throughout; substance of lungs inflamed.] *Abdomen.* Mucous membrane of intestines vascular; mesenteric glands enlarged; liver mottled on surface.

Case XCIX.

Ann Levitt, æt. 24, married. Admitted on the 16th day of fever, which came on with severe pain of the head and epigastrium; pain of head is now gone, giddiness remains; much pain of limbs;

scarcely any sleep; mind confused; eyes dull and heavy; face flushed; no uneasiness of chest; abdomen extremely tender on pressure; tongue red, parched, and cracked; lips and teeth sordid; bowels purged; pulse 123.

17th. After the application of ten leeches to the abdomen the tenderness is much diminished; the pulse fallen to 96; vomiting.

18th. Eight leeches again applied; abdomen now free from pain; vomiting continues; tongue unchanged; pulse 106.

19th. Vomiting undiminished; eight stools; abdomen again tender.

20th. Vomiting; five stools; pulse 108; slight pain of abdomen on full pressure.

22d. Abdomen tender, swollen, and tympanitic; eight stools; pulse 96; great prostration.

24th. Abdomen less tender and tense; still more prostrate.

25th. Stools in bed; pulse scarcely perceptible; features collapsed. Died in the night.

Head. Membranes of brain vascular; substance natural; effusion into the ventricles and at base; pituitary gland suppurated. *Thorax.* Mucous membrane of bronchi inflamed; tubes full of mucus, mixed with pus; [superior lobe of right lung a mass of tubercular disease; one of the tubercles the size of a pigeon's egg, in a state of suppuration; effusion of serum into the left pleural cavity.] *Ab-*

domen. Mucous membrane of jejunum and ilium much inflamed; caput coli firmly adherent to the abdominal peritoneum; large quantity of serum effused into the hepatic region; substance of liver soft; gall-bladder in a state of suppuration; contained three large biliary calculi; omentum inflamed; two large hydatids attached to the left ovarium.]

Case C.

Robert Ebbott, æt. 28, labourer. Admitted on the 12th day of fever: pain of head, which has been severe, is now only slight; frequent sighing; no pain of chest; frequent dry cough; respiration heavy and suspirious; abdomen tender; tongue dry, black, and cracked, red at apex; lips and teeth sordid; bowels purged; pulse 68.

15th. Mind confused; insensibility increasing; abdomen tender; tongue quite black and extremely dry; teeth sordid; respiration the same; no stool; pulse 72, feeble. Died next day.

Head. Dura mater natural; longitudinal sinus contained a firm cord of fibrin; arachnoid and pia mater vascular; substance of brain natural; pituitary gland softened and suppurating; much effusion into the ventricles; at the base the membranes were elevated into a large bag, distended with fluid.

Thorax. Mucous membrane of bronchi vascular; [right lung adherent to pleura, by a single point, at the upper part of the inferior lobe; substance contained numerous tubercles; left pleural cavity obliterated; left lung hepatized throughout, containing tubercles in every stage of disease; apex of heart adherent to pericardium.] *Abdomen.* Mucous membrane of ilium and cæcum inflamed and extensively ulcerated; [liver exceedingly enlarged and hard, almost of cartilaginous firmness and texture, weighed seven pounds two ounces; right kidney externally nodulated, internally healthy; left, healthy externally, but, when cut into, found to contain several abscesses; urinary bladder small; walls one third of an inch thick.]

Case CI.

Jane Hallam, æt. 28, married. Admitted on the 6th day of fever: attacked with overwhelming loss of strength and severe pain of the head; pain of head continues, with distressing vertigo; no pain of chest; no cough; abdomen tender; tongue covered with white fur, but is extremely parched; thirst urgent; thinks she has had thirty stools within the last twenty-four hours; mind tolerably distinct.

7th. Pain of head gone; mind much more dull and heavy; abdomen very tender; tongue has be-

come brown and continues extremely dry; four stools dark and offensive; pulse 104, soft.

8th. Scarcely any sleep; much restlessness; mind confused; insensibility increasing; pulse 90, weak. Died next morning.

Head. Membranes vascular; substance of brain in general much softened, but the floors of the ventricles especially were in an exceedingly softened state. *Thorax.* [Left pleuræ adherent at apex; superior lobe of left lung hepatized and stuffed with small tubercles; two adhesions in right pleuræ, one at apex; right lung stuffed with tubercles;] pericardium and heart healthy; condition of bronchi not stated. *Abdomen.* Mucous membrane of ilium and cæcum exceedingly vascular, but not ulcerated; patches of peritoneal coat of stomach vascular; [large lobe of liver scirrhous;] other viscera healthy.

Case CII.

Jonathan Studd, æt. 27. Admitted on the 28th day of fever; symptoms throughout appear to have been chiefly thoracic; at present frequent cough with viscid expectoration; great emaciation; pulse 102, extremely weak; no pain of head or abdomen; tongue foul; bowels regular; face pallid.

29th. Cough continues; abdomen not tender; tongue brown and dry in middle, red at tip and

edges; three stools; pulse 100; mind dull and confused; muscular tremor.

30th. Cough the same; tongue unchanged; lips and teeth sordid; three stools mixed with blood; delirium; muscular tremor increased; pulse 108.

31st. Abdomen has become tympanitic; three stools mixed with blood; delirium and muscular tremor increased; pulse 112, weaker.

47th. On the evening of the day of last report he slept better and waked improved in all respects; this improvement appeared to be steady and progressive; the stools became natural; the pulse diminished in frequency and increased in strength; on this morning the stools continued natural; the pulse was 90, and he still seemed to be gradually though slowly recovering, when, without the return of any unfavourable symptom, he suddenly expired.

Head. Membranes and substance of brain healthy, but more fluid than natural in the ventricles. *Thorax.* Mucous membrane of bronchi greatly inflamed and thickened; bronchial tubes full of mucus mixed with pus; pleuræ of left side of chest extensively adherent; substance of left lung healthy excepting some slight patches of hepatization. *Abdomen.* Mucous membrane of small intestines extremely vascular, in many places presenting the appearance of ecchymosis; at the valve of the colon several small ulcers; other viscera healthy.

Case CIII.

John M'Carty, æt. 22, labourer. Admitted on the 22d day of fever; complaint commenced with symptoms of severe cold; at present, slight pain of chest; cough, inducing pain in the abdomen, which is not tender; pain of head gone; eyes injected and suffused; face flushed; tongue brown and dry; bowels stated to be regular; pulse 99, weak.

23d. Cough very severe; abdomen not tender; tongue dry, brown and cracked; four stools; no pain of head; face flushed; eyes ferrety; pulse 90.

24th. Mind more confused; eyes more injected; delirium.

25th. Insensibility increasing; no sleep; tongue more dry and brown; lips and teeth sordid; four stools; pulse 96.

26th. Constant delirium; stools and urine in bed; pulse 104.

28th. Died.

Head. Membranes and substance of brain vascular; more fluid than natural in ventricles. *Thorax.* Mucous membrane of bronchi vascular; [pleuræ of right side slightly adherent.] *Abdomen.* Mucous membrane of jejunum, cæcum and ilium very much ulcerated; spleen soft; other viscera healthy.

Case CIV.

Sarah Nash, æt. 14. Admitted on the 22d day of disease; pain of head appears to have been very severe but it has now wholly subsided; lies quite insensible; pupils dilated, but contractile; muscles of extremities quite rigid; hands clenched; arms and legs extended and inflexible; no tenderness of abdomen on fullest pressure; tongue brown and dry; no stool for four days; pulse 110, extremely feeble and indistinct.

23d. Muscles of lower extremities rather less rigid; hands continue clenched; eyes in general closed; when opened appear injected and suffused; much grinding of the teeth; great restlessness; noisy delirium; two stools; pulse 126, stronger.

24th. Great restlessness; scarcely any sleep; almost constant grinding of the teeth; pulse 129, of good power.

26th. So restless that the pulse cannot be counted; exceedingly peevish; began to take two grains of calomel with half a grain of opium every four hours.

27th. Little change excepting that she is now sensible of some pain in the epigastrium on full pressure, and acknowledges some pain in the head; pulse 142.

32d. No amendment in the cerebral symptoms,

and the strength is diminished; the mecurial odour is already quite evident, and the mouth is slightly ulcerated; no ptyalism; pulse 126, weak; calomel and opium omitted.

36th. Noise and delirium continue; ulceration of mouth gone; pulse 140, very weak. Calomel and opium were again resumed.

27th. Slight ptyalism; no improvement; pulse 130, extremely weak and indistinct.

38th. Ptyalism continues; sinking. Died.

Head. Membranes vascular; substance of brain much softened; effusion between all the membranes and into the ventricles. *Thorax.* Bronchi of both lungs vascular, and contained a large quantity of purulent matter; right lung much hepatized; left slightly consolidated. *Abdomen.* Ilium and cæcum very much ulcerated; spleen very firm, contained one tubercle; other viscera healthy.

Case CV.

William Gander, æt. 22, servant. Admitted on 15th day of fever; no account to be obtained of previous symptoms; some pain of head; much giddiness; mind confused; delirium; expression of eyes wild; face flushed; abdomen tender; tongue foul at root, moist, very red at apex; bowels purged; pulse 99, of good power.

16th. No sleep; violent noisy delirium; eye-

brows contracted; face flushed; six stools; pulse 100.

19th. Intensity of cerebral symptoms progressively increasing; constant violent delirium; muscular tremor; subsultus; tongue cannot be protruded; pulse 112. Died next day.

Head. Membranes vascular; substance of brain natural; four ounces of serum in the lateral ventricles. *Thorax.* Mucous membrane of trachea and bronchi highly vascular; other viscera healthy. *Abdomen.* Glands of the mucous membrane of the intestines in general enlarged, many of them inflamed; some of them in a state of commencing ulceration, others completely ulcerated, so that the ilium and lower part of colon were full of ulcers, which varied in size, from that of a split pea to a crown piece; mesenteric glands much enlarged and dark; spleen very soft; other viscera healthy.

Case CVI.

George Bury, æt. 9. Admitted on the 11th day of fever: complaint commenced with nausea, pain of abdomen and severe head-ache; the latter continues; abdomen, especially epigastrium, tender; tongue red; much thirst; bowels constipated; pulse 116.

14th. Pain of head gone; countenance extremely pallid; no sleep; great restlessness; delirium; ab-

domen still tender; tongue red and dry; eight stools, dark and offensive; pulse 130. Died next day.

Head. Membranes vascular; substance of brain highly vascular; pituitary gland in a state of suppuration; cerebellum vascular; effusion between dura mater and arachnoid; one ounce of serum in ventricles, two at base; pia mater covering the spinal cord highly vascular; substance of cord natural. *Thorax.* Mucous membrane of bronchi slightly vascular; tubes contained some mucus, mixed with pus; [left pleuræ slightly vascular; lower lobe of left lung hepatized; right pleuræ healthy; lower lobe of right lung also hepatized, and contained several hard tubercles;] other viscera healthy. *Abdomen.* Mucous membrane of lower end of ilium and entire cæcum thickly studded with ragged ulcers, raised and very foul, with indurated margins and irregular surfaces; longest diameter of ulcers in direction of longitudinal fibres of muscular coats; mesenteric glands very large, many of them being the size of almonds; other viscera healthy.

Case CVII.

John Meredith, æt. 23, porter. Admitted on the 22d day of fever, which came on, besides the ordinary symptoms, with pain of chest, cough and hoarseness: states that these symptoms were getting better when, a few days ago, he was attacked with

pain of the abdomen, accompanied with loose stools: at present the abdomen is exceedingly tender on pressure; tongue brown and dry in the middle, edges white and moist; bowels purged; distressing hiccup; pain of head, which was severe in the commencement, gone; mind dull and heavy, but answers any question distinctly; countenance anxious; features sunk; pulse 88, feeble; slight degree of hoarseness and some cough remain.

23d. Tenderness of abdomen undiminished; hiccup continues very distressing; vomiting; bowels purged; tongue brown and dry; scarcely any sleep; pectoral symptoms the same; pulse 76.

24th. Tenderness of abdomen, hiccup, vomiting, purging, all increased; eight stools since last report; much restlessness; pulse 84.

25th. Appeared to be more easy yesterday, but relapsed into his former state to-day. Died following morning.

Head. Membranes vascular; arachnoid thickened and opake; substance of brain vascular; more fluid than natural in the ventricle. *Thorax.* Mucous membrane of bronchi vascular; other viscera healthy. *Abdomen.* Mucous membranes of small intestines vascular; [peritoneum universally and greatly inflamed; that covering the intestines coated with a layer of coagulable lymph, by which their convolutions were united into one diseased mass; false membranes were formed by this exudation which

extended from the under surface of the liver to the right iliac fossa, where they formed a cyst, in which eight ounces of purulent matter were contained; the peritoneum covering the abdominal surface of the diaphragm inflamed; liver enlarged,] but its substance appeared healthy; other viscera natural.

Case CVIII.

Elizabeth Turner, æt. 26, servant. Admitted on the 15th day of fever: no account to be obtained of previous symptoms: at present extremely restless; much delirium; almost constant talking or moaning; no sleep; mind quite confused and wandering; when roused to answer a question she seems sensible for a moment, but immediately lapses into low muttering incoherence; if asked whether she has any pain in the head she points to the forehead; says she has no pain in chest or abdomen; no cough; abdomen not tender.

16th. No sleep; constant restlessness; almost unceasing incoherent talking; incapable of answering when spoken to; tongue cannot be protruded; stools in bed; pulse too feeble and indistinct to be counted. Died in the evening.

Head. Dura mater along the course of the longitudinal sinus very adherent to the arachnoid; arachnoid and pia mater white and opake; surface and substance of brain highly vascular; surface of cere-

bellum vascular; substance healthy; pituitary gland suppurating; more fluid than natural in the ventricles; an ounce at the base. *Thorax.* Mucous membrane of bronchi highly inflamed; bronchial tubes filled with mucous mixed with pus; [pleura costalis of right side vascular; slight effusion into right pleural cavity, and into parenchyma of right lung; lower lobe much inflamed; pleuræ of left side adherent; that covering left side of diaphragm much inflamed; substance of left lung partly inflamed, partly consolidated.] *Abdomen.* Mucous membrane of small intestines inflamed; in that of ilium numerous large, raised ulcers; [liver adherent by several unnatural connexions to diaphragm, spleen and transverse arch of colon, but its substance was healthy; appendix vermiformis likewise adherent to abdominal peritoneum;] head of pancreas enlarged; [internal inguinal glands much enlarged, and some of them impacted with calcareous matter;] other viscera healthy.

Case CIX.

Mr. W——, æt. 50. The progress of this case having been observed with great care from the commencement to the termination of the disease, and affording an excellent illustration of the insidious manner in which the mixed form of fever sometimes attacks, and of the silent but rapid progress it makes

without exciting alarm, until, at last, symptoms the most formidable, and which, to those who are not acquainted with the nature of the malady, appear to be most sudden, supervene, it may be useful to give a detailed account of it.

This gentleman had been out of health six months previously to the present attack of fever: he had been observed to be gradually losing flesh, and fading; yet he laboured under no complaint that could be ascertained, excepting that his appetite failed; that he could digest well no kind of food; that he was badly nourished and, therefore, weaker in body and less vigorous in mind than usual.

About three weeks before the fever commenced, his stomach-complaints became worse, and for these he requested the advice of his friend Mr. Chaldecott. During this gentleman's attendance, his patient was one day attacked with slight chilliness, an unusual degree of lassitude, together with pains in the limbs: but the chilliness never amounted to rigour; the general pains were not severe; there was no pain whatever in the head; yet the sudden debility which affected both mind and body was very striking. Still the mind was perfectly distinct; the sleep was sound; the expression of the countenance was natural; the tongue, however, became loaded with white fur; there was some thirst; the pulse varied from 84 to 96, while the temperature and the softness of the skin remained in a healthy state. In this man-

ner he went on about eight or ten days, and, during the whole of this period, he was daily questioned by his medical attendant and examined with much anxiety relative to the condition of the organs in the head, chest and abdomen; but he was steady in affirming that he was free from all uneasiness in the head, and that he had no pain in the chest; nor could any pain be excited by the fullest pressure, either in the epigastrium or in any part of the abdomen. It was observable, however, that he had some cough without expectoration, and that his respiration was short and hurried. His appearance, too, indicated more disease than his sensations; he was obviously worse than he expressed, or than could be accounted for from the apparent affection of any organ, and this excited alarm both in his family and in his medical attendants; and it is always a truly alarming condition.

On the 11th day a remarkable change took place: for two or three hours he was chilly; to this succeeded heat of skin and flushing of the face; what was very alarming, the colour of the flush was purple, while that of the whole face was dusky; there was no cough, but the respiration was short and hurried; the mind was confused and dull, though a coherent answer might still be obtained to any question that was asked; the pulse now rose to 120, there was little or no sleep, but great restlessness during the night, in the course of which delirium

appeared, and the next morning there came on muscular tremor. As the day advanced the flushing and heat disappeared; the mind became quite distinct, and the pulse fell to 96. Towards evening he again became restless, the pulse rose to 104, and about one o'clock, a.m. the increased heat, the flushing of the face, the purple colour of the cheek, the dusky appearance of the skin, the short and hurried respiration, and the convulsive action of the muscles all returned, and in a greater degree, while the pulse again rose to 120. From this state he never recovered in the least degree, but became more and more dull, and at length nearly insensible; his debility rapidly increased until it became extreme; he lay quite prostrate on the back, with his arms extended, as if lifeless; the muscular tremor increased; the respiration became extremely short and hurried; the tongue became dry, red, glazed, and sticky; the bowels torpid; the pulse 130; and with these symptoms he expired on the 13th day of fever.

Head. Dura mater healthy; arachnoid thickened and opake; much gelatinous effusion between it and the pia mater; substance of brain highly vascular and firm; lateral ventricles distended with fluid, much also at the base. *Thorax.* Mucous membrane of bronchi universally of a dark red colour and lined with a tenacious fluid, which was slightly sticky; bronchial tubes filled with frothy mucus; substance of lungs perfectly healthy. *Abdomen.*

Mucous membrane of small intestines generally inflamed; lower part of ilium and commencement of colon filled with large and raised ulcers, some of which were just forming, while others had penetrated through a thick mass of adventitious deposit to the muscular coat of the intestine.

Before closing these illustrations of the pathology of fever, it may be proper to give an example of the modifications which take place when this disease proves fatal in the state of gestation. If fever attack during pregnancy, there is the greatest possible danger of miscarriage, and the great majority of those who miscarry die. There is no complication which requires a more delicate and cautious manangement; and the management which experience shows to be the best will be stated in the proper place: in the mean time, the following case is given as an illustration of the morbid appearances which are found (and the appearances are very uniform) when abortion is the precursor of death.

Case CX.

Mary Cutler, æt. 37, married. Admitted on the 5th day of fever, in the commencement of which, in addition to the ordinary symptoms, there was much nausea; this feeling continues at present, and is now accompanied with vomiting; epigastrium tender; cannot lie without pain in the left side; cough fre-

quent, and exciting uneasiness in the chest; tongue white and dry; bowels bound; some pain of head, especially in the forehead; scarcely any sleep; much pain in the extremities; pain of throat with difficult deglutition; pulse 122; skin warm; six months pregnant.

6th. Much retching and vomiting; tenderness of the epigastrium and abdomen; bowels very loose; tongue white in the middle, red at the edges; severe pain in the chest; great dyspnœa; constant, urgent cough with difficult mucous expectoration; severe pain in the head; no sleep; great restlessness; pulse 150, sharp but compressible. V.S. ad ℥xij.

7th. Buff on blood extremely firm; retching and vomiting gone; pain of side entirely removed; less cough; dyspnœa diminished; pain of head better; slept much better; pulse 120.

9th. After a tolerable night, attacked this morning with urgent dyspnœa, soon became perfectly insensible; was delivered of a fœtus six months old; at present, nearly insensible; respiration hurried and laborious; tongue brown and dry; one stool; pulse 110; skin moderately warm.

10th. Free lochial discharge; all the symptoms greatly improved; tongue white; moist; pulse 84, soft.

13th. Lochial discharge nearly ceased; no pain in head, abdomen, or any where, except the face which is attacked by erysipelas; tongue continues moist and is nearly clean; pulse 108.

14th. Erysipelas increased and extending; tongue has again become brown and dry; pulse 110.

16th. Erysipelas extending; severe pain in epigastrium and over abdomen, much increased on pressure; distressing sense of nausea but no vomiting; tongue the same; pulse 96, weak and irregular.

17th. Pain of abdomen increased; stools in bed; no sleep; extreme restlessness; respiration hurried and wheezing; pulse 130, weak. Died in the evening.

Head. Membranes of brain vascular. *Thorax.* [Pleuræ covering right lung coated with a layer of coagulable lymph; in both pleural cavities a large quantity of serum mixed with flakes of lymph and pus; that part of the pleura of the right side which lines the diaphragm highly inflamed;] substance of both lungs healthy. *Abdomen.* Peritoneum in general more vascular than natural; patches of it in a state of intense inflammation; peritoneal sac contained much serum mixed with flakes of lymph and pus; pelvis of right kidney inflamed; ovaria and uterus of very dark colour and intensely inflamed; other viscera healthy.

It would be easy to multiply cases to an indefinite extent, but, since those which have been cited exhibit a complete view of the pathology of fever, as far as it has yet been ascertained, any further details

would fatigue the reader without instructing him. And what is this pathology? What are the events, the detail of which has occupied us so long? The account of the pathology of fever is the history of inflammation, and the description of the individual changes that take place in the organs that constitute the febrile circle, is an enumeration of various products of inflammation which are formed within them. There is scarcely a fatal case of fever which does not afford, in one or other of the organs of that circle, some inflammatory product; there is no considerable number of fatal cases which does not furnish a specimen of every inflammatory product. And what are the severest cases of fever, and why are they the severest? With the single exception immediately to be stated, the severest cases are those in which, together with a severe primary affection of the nervous system, this inflammatory action is in the greatest degree of intensity, and is seated in the greatest number of organs; and they are the most severe, not only on account of the severity of the primary affection of the nervous system, but also because it is in them that the inflammation is the most intense, and because that inflammation attacks the system at one and the same time in the greatest number of points. From among the preceding cases, fix upon any one in which the powers of life were, from the commencement, the most completely overwhelmed, and in which they were the most ra-

pidly exhausted, and when the brief struggle for existence is over, examine the changes that have taken place in the internal organs—what is it that is found? traces of inflammation, legible, deep, extensive; while, in almost every case, these traces are thus legible, deep, and extensive, in proportion to the apparent intensity of the fever, and to the rapidity with which it extinguished life. In this point of view, how important, how instructive, how invaluable is the lesson which the mixed cases of fever afford! With few and rare exceptions (and in all diseases some exceptions occasionally occur to what appear to be the best established and the most invariable laws) these are the cases in which the symptoms are the most urgent, and in which they run their course with the greatest rapidity; these are the cases in which the debility is the most striking; in which it comes on the most early, and proceeds to the greatest degree of prostration; these are the cases which are the most purely typhoid, the most truly adynamic; these are the cases which, in general, commence with the most sudden and alarming deprivation of physical and mental power; in which all pain and uneasiness are soonest lost in stupor, in which the stupor most rapidly increases to insensibility; in which delirium comes, perhaps, as early as the third or fourth night, accompanied with its attendant, muscular tremor, and too often with its most formidable ally, erysipelas: in which, at this

early period, the respiration is short and hurried, the skin dusky, the colour of the cheek purple, the tongue brown and dry, the lips and teeth sordid, the abdomen tender, and the stools loose; in which, in a day or two more, the abdomen is swollen, tense, and tympanitic, the stools passed in bed, the patient prostrate on his back, completely senseless and powerless, while the pulse is 120 or 130, and so feeble that it can scarcely be distinguished. But what is this debility? in what does this adynamic state consist? It consists of a peculiar affection of the nervous system, followed rapidly by intense inflammation of the brain or of its membranes, or of both: by intense inflammation of the mucous membrane of the bronchi, and by intense inflammation or extensive ulceration of the mucous membrane of the intestines. And why is the patient weak or adynamic? Because he is not only assailed by an affection of the nervous system, which deprives the organs of the stimulus necessary to enable them to perform their functions with due vigour, but, at the same moment, inflammation is set up in three of the great systems, the healthy action of which is most essential, not only to strength but to life: thus the citadel is attacked at one time at three of its capital points. It is not asserted that inflammation alone constitutes the state of fever, nor that the danger of the patient is always in exact proportion to the degree of the inflammation. How it differs from

inflammation, and what is superadded to the inflammatory state, will be shown immediately; but it is a most important fact, that the degree of the debility is most intimately connected with the intensity and the extent of the inflammatory action. Now and then, as has been already stated, the intensity of the nervous affection is so great, and so rapidly destructive of life, that there is no time for an inflammatory process to be set up, much less for an inflammatory product to be formed. The patient is struck dead as if by lightning, or by Prussic acid, or by apoplexy. In this country, he does not actually die as instantaneously as he might be destroyed by the electric fluid or by poison, although there are countries, seasons, and particular spots, in which the concentration of the febrile poison appears to be sufficiently great to extinguish life instantaneously; and even in this country, life is sometimes destroyed by a stroke of fever as rapidly as it is by a stroke of apoplexy, when the latter does not prove fatal in the first few hours.

Now the peculiarity in these cases is, that the internal organs, after death, exhibit no signs of inflammation, unless vascularity be inflammation. The organs which, in ordinary cases, are inflamed, are in these cases turgid with blood. Are the terms debility or adynamia appropriate expressions to designate even this condition of the organs? Just as appropriate as they would be to express the condi-

tion of a person who is struck dead by lightning, whose muscles are incapable of contraction, and whose blood will not coagulate. Those who apply these terms even to such forms, and, *à fortiori*, to any other forms of fever, must be ignorant either of the nature of the disease, or of the constitution of the human mind. If they know the disease, they know that the patient appears to be weak because the primary operation of the disease is upon the nervous system—an operation which, as has just been stated, while it disturbs that due and equal distribution of nervous influence which is necessary to the healthful action of the organs, and, therefore, to the general strength of the system, is not incompatible with, but promotive of an excitement of the vascular system, which terminates in inflammation. Debility is the last, the ultimate result of the disturbance of the functions of a certain series of organs, but part of this very disturbance of function, and a most important part, a part which exerts the greatest influence over the progress of the disease and the life or death of the patient, consists not in the weakened, but in the augmented strength and the increased activity of the vascular system. To designate the ultimate result upon the system by a term which gives an entirely false view of the individual processes in the economy, by which that ultimate result is produced, must, we repeat, arise either from an ignorance of the true nature of those

processes, or from not reflecting on the influence which words exert over the manner in which the human mind conceives of things. For the sake of the progress of the science of medicine, for the sake of rendering the language of medicine the correct expression of the knowledge which the science has actually attained, and, above all, for the sake of accomplishing the great object of medicine, the preservation of human life, it is high time that these terms with which physicians have so long allowed their minds to be abused, should be banished from medical nomenclature, or, at any rate, from that part of its nomenclature which appertains to fever.

II. Pathology of the Fluids in Fever.

The pathology of the solids in fever, derived from inspection of the fatal cases after death, has already acquired, as we have seen, a high degree of perfection. The pathology of the fluids is scarcely at all known, and the difficulty of arriving at exact and certain results is great. Why the investigation of the morbid changes that take place in the fluids should be a much more arduous task than that of tracing the changes produced in the structure of the organs, is too obvious to need to be pointed out; but those only who have actually engaged in researches of this nature can form a just conception

of the number of repetitions that are requisite of the same analysis, of the care required in conducting each, and consequently, of the labour and time it is necessary to devote to the investigation, before satisfactory results can be obtained. The analysis of the animal fluids in their healthy state is far from being perfect; yet their composition in the state of health must be ascertained, as far as it can be ascertained, as a preliminary step: and, in order to discover the morbid changes that take place in the blood, in the urine, in the products of respiration, and in those of transpiration, and still further to determine the nature and extent of such changes in the different types and stages of fever, it is obviously necessary to examine the respective fluids and gases in a great number of cases, and to vary the experiments in a great variety of modes. Experiments of this kind, on an extensive scale, have been undertaken by my friend Mr. Cooper; and, when this work was commenced, they had already advanced so far that there appeared to be a prospect that, before its completion, they would be sufficiently matured to justify us in laying the results before the reader. And that deviations from the state of health, and some of them of great importance, do take place in these fluids, and especially in the blood and the urine, is ascertained. What they are, with what degree of constancy they occur, how far they are respectively connected with the cerebral, the thoracic, the abdominal, and the

mixed affections, with different degrees of intensity in these affections, and with different stages of their progress, we hope, at no distant period, to be able to lay fully before the public.

In the mean time, it is of some importance to bear in mind the true place which the results of such experiments, be those results what they may, and be they established with all the clearness and certainty that can be desired, must always hold. Changes in the fluids can only be second in the series of morbid events; they can never hold the first place in that series; they can never be primary antecedents or first causes, but merely sequents or effects. To assign the reason of what must be so obvious to every one who is acquainted with the elements of physiology, would be entirely out of place here, because it would suppose the reader to be wholly ignorant of the functions of the animal economy. Our knowledge of the pathology of fever can never be complete, until we know the morbid changes that take place in the fluids as perfectly as we are acquainted with the alterations of structure that are produced in the solids, and we ought, therefore, to spare no labour to render our knowledge of the former as exact and certain as it is of the latter. But, as far as we can at present see, when this is accomplished, we shall have acquired little that is of practical utility. There is but slight, if there be any ground to hope that, when the humoral pathology shall have arrived at the greatest possible degree of

perfection, it will furnish us with any additional means of preventing, curing, or even mitigating the severity of the disease. With that disorder of the system over which we have some control, with those morbid actions which we possess some means of subduing or changing, we are already well acquainted. In our knowledge of the invariable tendency there is to the production of certain changes in the structure of certain organs; in our knowledge of the vascular action by which those alterations are effected, we may be said, in a practical point of view, to be already in possession of the most important part of knowledge which we can ever hope to acquire, unless, indeed, we may indulge the expectation, of which it would be truly melancholy to be deprived, that we may discover a more sure and effectual mode of preventing these organic changes, or of restoring to a sound state the organs that may become diseased. It is this part of the pathology of fever alone that can afford a clear and steady light to conduct us to the safe and effectual treatment of the malady. Every step we take without this invaluable guide must be taken in the dark, and will be, therefore, not only likely to be false, but very likely to be fatal. When, on the contrary, we undertake the management of fever under the direction of this faithful guide, in every measure we venture to adopt we, at least, know at what we aim: we propose to ourselves a definite object which we endeavour to accomplish by an instrumentality with

the powers of which we are in some degree acquainted: we may not succeed, but we fail because we want the means to do what we clearly see requires to be done: if we do not arrest the progress of the disease, at least we do not add to its strength by the adoption of violent and desperate expedients, because we feel called upon to do something, yet know not what to attempt; we do not destroy, if we cannot save. The physician, enlightened by the pathology of the disease, who prescribes for a patient in fever, is like a skilful surgeon, who is guided in the performance of a difficult and delicate operation by a knowledge of anatomy so intimate, that every touch of his scalpel exposes a tissue with which he is acquainted, and discloses the site of a vessel with which he is familiar; the object aimed at by the operation may not be obtained, but, at least, the cause of its failure is not that the operator wounds a structure which he ought to have avoided, or opens an artery, of the situation and distribution of which he is ignorant. On the contrary, the physician who prescribes for a patient in fever, without knowing the pathology of the disease, is like a Charlatan, who plunges his instrument boldly into the chest or the abdomen, without knowing where it goes or caring what it wounds; it may possibly open a tumour and let out the disease, but it is more likely to pierce some vital organ and to let out life.

CHAPTER VII.

Of the Relation between the Phenomena of Fever; or the Theory of the Disease.

In the preceding chapters it has been shown what are the real events which take place in fever, the assemblage of which constitutes the disease: it has also been shown in what order these events succeed each other, and upon what conditions of what organs they depend. To assign further the true relation between these events, is to establish the theory of fever in the only philosophical sense of the term theory: and that relation must already have suggested itself to the mind of the attentive reader.

We have seen that the first indications of disease are clearly traceable to the nervous system: that the disorder of the functions of the brain and spinal cord with which the attack always commences, demonstrates that these organs form the primary seats of the malady: that the derangement in the functions of these organs is truly *invariable*, and is invariably the first morbid condition that is observed to take place: that there never was

a case of fever, from the slightest to the most severe, in which these organs were not in a greater or less degree in a disordered state, and in which that disordered state did not precede every other. This affection of the nervous system then, the invariable antecedent of all that follows, is the primary essential event in the morbid series which constitutes fever.

What the real nature of this primary affection of the nervous system is, we are wholly ignorant, and we ought at once to confess our ignorance. We have already entered into some considerations, derived from the difference in the order in which the phenomena of fever and of inflammation succeed each other, to show that these two diseases are not identical.* When these phenomena are still more attentively considered, other differences are observable between them, which confirm the opinion that the two diseases are not the same. Not only is derangement in the nervous and the sensorial functions invariably the first in the series of morbid events in fever, while it is not the first in inflammation, but that derangement is always much greater in the former than in the latter, and proceeds in a regular and determinate course, such as has been fully explained in the preceding pages, and to which there is nothing analogous in the progress of inflammation.

To the condition of inflammation a peculiar but

* See page 63, et seq.

an unknown condition of the blood-vessels appears to be indispensable. To the state of fever, no such condition of any part of the vascular system, as far as we have the means of judging, is absolutely indispensable, although it be very commonly coincident. No such condition appears to be present, at least no such condition has yet been ascertained to be present, either in the very mildest or in the severest form of the disease: at the latter extreme of the scale, at least, we might expect to find the most striking and unequivocal indications of the existence and operation of inflammation, were that agent really present; and yet it is precisely here that the ordinary signs of inflammatory action are completely absent.

Moreover, we have no example of instantaneous death by the sudden excitement of inflammation in any organ, or in any number of organs: inflammation is a process: a certain number of events take place in a certain order; and there is always, as far as has been hitherto observed, some interval between these events. A case is recorded in which inflammation of the bowels (acute enteritis) proved fatal, as was supposed, in eight hours from the commencement of the attack; but so rapid was the process, that the intelligent surgeons who witnessed it doubted whether the time when the disease began could have been noted accurately: at all events, it does not accord with the best-established

facts relative to the process of inflammation, that it should prove fatal without the lapse of some hours. Fever, on the contrary, does not need as much as a single hour to complete the work of death. It is well known that the poison which, in a certain state of concentration, produces fever with the ordinary period of duration, in a higher state of concentration produces instantaneous death; and that, in certain climates and seasons, it is not uncommon for persons previously in sound and vigorous health, on exposure to that poison, to sicken and to die in a shorter space of time than is requisite, under ordinary circumstances, for the mere formation of the inflammatory process. The state of the system, in the primary attack of fever, and the state of the system in inflammation, do not, therefore, appear to be identical. The truth is, that we do not know what the real state of the system is in either case, but we see that the phenomena of the one differ from those of the other; to conclude, therefore, that the states are the same is not a sound induction. While, then, we are constrained to admit that we know nothing of the nature of the primary affection of the nervous system in fever, the closest consideration of all the phenomena alike constrains us to conclude, that that affection is peculiar and specific.

This peculiar and specific affection appears to be much more analogous to the condition into which the nervous system is brought by the application of

certain poisons, than to that which is proper to pure inflammation. The more closely and extensively the subject is investigated, the more clear and satisfactory the evidence becomes, that the great primary cause of fever is a poison, the operation of which, like that of some other poisons, the nature of which is better understood, and the action of which has been more completely examined, is ascertained to be upon the nervous system. How these poisons act upon the nervous system we do not know, nor can we possibly know, as long as we remain so profoundly ignorant of the nature of the action of the nervous system in the state of health.

It may be considered then as established, that the primary morbid condition of the body, in fever, consists of an affection of the nervous system, which there is reason to believe is of a peculiar and specific nature, although that nature be at present wholly unknown.

This specific derangement of the nervous system having continued for some time, the vascular system becomes disturbed. How the nervous system so influences the vascular as to bring it into the morbid condition into which it passes, is as unknown to us as the peculiar affection of the nervous system itself. That there is the most close and intimate connexion between these two systems, and that they exert over each other the most important influence

both in the state of health and of disease, are in the present state of our knowledge ultimate facts.

With two apparent exceptions, (whether these two cases form real exceptions may still admit of doubt) the vascular derangement connected with, and dependent upon nervous derangement, passes sooner or later into true inflammation. Of this we have the most complete and indubitable evidence—evidence derived both from changes, the known results of inflammatory action, produced in the structure of organs; and from the generation of new products, such as are formed by no other known process but that of inflammation. Almost every change of organic structure which inflammation is ascertained to be capable of producing, is found to take place in fever: almost every product which inflammation is ascertained to be capable of forming, is observed to be generated in fever: it is not possible to doubt, therefore, that the morbid condition into which the vascular system is brought in the progress of fever, is that of inflammation. In what circle of organs inflammation is peculiarly liable to be excited in this disease, by what particular character febrile inflammation is distinguished, and what remarkable differences it exhibits in intensity and extent, have been fully illustrated.

It follows, then, that the second event that takes place in the morbid series constituting fever, is inflammation.

But however really and constantly inflammation may take place in fever, and in whatever intensity, and to whatever extent it may be carried, yet the inflammation is never pure or simple: the condition of the inflamed organs is never the same as that into which they are brought by mere phlegmasia: there is always inflammation, and *something else:* and if what we have so much insisted on be true, this must necessarily be the case, because the state of inflammation succeeds to another, a distinct, and a pre-existing condition of the system: that something else is the unknown, but the peculiar and specific affection of the nervous system, which has already been stated to be the invariable antecedent of whatever subsequent affection may take place. Thus this affection of the nervous system is not only the invariable antecedent of every other condition, but it is omni-present with every other condition, and its presence is a most powerfully influential presence; is operates at every instant, in every organ, and every function of the economy, although, as we have seen, its operation is peculiarly great, and, as far as we can perceive, specific in certain organs and functions. The combination of this nervous affection with inflammation, and the influence which this combination exerts over the inflammatory state, we express by saying that the inflammatory state in fever is modified: we see that inflammation is present, but we see that it is not

the same as inflammation in a pure phlegmasia: we see, as has just been stated, that there is inflammation, and something else superadded; namely, a peculiar affection of the nervous system, which gives to the febrile inflammation a peculiar character, or which modifies it in a specific manner.

It has been stated that there appear to be two exceptions to the universality of the presence of inflammation. Of these exceptions, one is exemplified in the mildest form of the disease. In every case of fever, the function of the vascular system is disturbed in a greater or less degree, as has been fully shown: but the doubt is whether that disturbance invariably pass into the state of inflammation. Since the morbid condition of the nervous system, in the mildest case, remains only for a certain period, and then uniformly gives place to the return of health, there seems to be no possible means of determining this question. And even in the second case, where the intensity of the nervous affection is incompatible with life, and death follows with extreme rapidity, the real condition of the vascular system appears to be equally doubtful. In both, that condition may possibly be a modification of one and the same state, and that state may be identical with inflammation—inflammation existing in different degrees of intensity. On the other hand, both may differ essentially from the state of inflammation. The nervous affection in the first may be too slight to excite inflammatory

action, while in the second it may be so overwhelming as completely to oppress every function of the economy, and therefore, instead of exciting, may paralyse the capillary blood-vessels; and consequently paralysis of the capillary vessels, instead of intense excitement of them, may possibly be the real condition of the vascular system, for example, in congestive fever.

But however this may be, the only difficulty in the subject relates to these two forms of the disease —the very mildest and the very severest. In all the intermediate cases, the condition of the vascular system is clear and certain. In all these, there can be no more doubt that that system is in a state of true inflammation, than there can be that the capillary vessels of the pleura are in a state of inflammation in pleuritis. Yet, as we have just stated, in fever the inflammation is never the same as it is in pleuritis. In fever there is a combination of a specific affection of the nervous system, with that specific affection of the vascular system, which constitutes the state of inflammation: in pleuritis there is the specific affection of the vascular system, without the specific affection of the nervous; and this combination of the two affections in fever modifies the nature of febrile inflammation.

This view of the constitution of fever appears to explain in the most luminous and complete manner every peculiarity of the febrile state: to reconcile all its apparent anomalies, with which few

who have studied the subject have not been perplexed: to establish the true distinction between fever and inflammation; and to show why the phenomena exhibited by these two affections are so essentially different, and why therefore each requires a different mode of treatment. In this point of view no theory was ever more eminently practical, or led to a more guarded practice. Inflammation does not lose its nature by being combined with that peculiar affection of the nervous system which converts it into fever; it only modifies its state: the remedies proper for fever do not differ from those which are effectual in inflammation; they only require to be modified in accordance with the modified nature of the disease. He who believes fever to consist of an affection of the nervous system alone, every other affection that may be combined with it being accidental, will rarely think of using the lancet: he who believes fever to consist of inflammation alone, and overlooks the presence of the nervous affection, will be apt to carry the employment of the lancet too far: he alone who embraces the view of both, brings within his own all the phenomena: he alone adopts a sound theory of the disease, and we now see that he alone is likely to be led to a sound practice. When the theory of a disease collects, arranges and points out the true relation between all its phenomena, there is good reason to conclude that

that theory is sound; but when it moreover directly leads to that treatment of the malady which experience shows to be the most safe and the most effectual, its truth is established by every test that can be applied to it.

The consideration of the diseased states of the other systems and functions that take place in fever, need not detain us long. The respiratory appears to be the next function that becomes deranged. The intimate and inseparable connexion which physiology teaches us subsists between the respiratory and the circulating systems, might lead us to anticipate the fact which pathology demonstrates. We know that the respiratory system is constructed for the circulating: that the form, the extent, the complication of the respiratory apparatus depend entirely upon the quantity of blood that is to be regenerated, and the degree of perfection with which that regeneration is to be accomplished. It is therefore impossible that any considerable derangement in the function of one of these systems should continue long, without being accompanied with a proportionate derangement in the other. The function of respiration cannot be materially deranged, without producing a morbid condition of the blood, that vital fluid which it is the specific object of the process to purify and regenerate. The function of secretion depends upon the quality of the blood conveyed to the secreting organ, upon the action of

the capillary vessels of that organ, and upon the supply of nervous influence received by those vessels; it follows, that in a disordered state of the nervous, the circulating and the respiratory organs must be attended with a derangement in the process of secretion; while the excreting being necessarily connected with the secreting processes, the vitiation of the one cannot fail to occasion a corresponding deterioration of the other.

Thus we see that the organs and functions deranged in fever are closely and inseparably connected: that no continued disorder can take place in the one, without producing a proportionate disorder in all the others: that a peculiar and specific affection of the first, according to the established laws of the vital economy, invariably produces a peculiar and specific affection of the second, and the second, a third, and so on throughout the circle. And now we see why a certain number of organs are invariably affected in fever; why these organs invariably become affected in a certain order; why the nature of their affection is invariably the same; and why, finally, the ultimate condition of the system, the general result of these individual morbid changes, never varies.

Writers on fever in general have confined their account of the phenomena of this disease to an explanation of the relation between the cold and the hot fits. Were their success in establishing that

relation as complete as it is defective, they would still have done little or nothing, by a view so incomprehensive, towards establishing the theory of fever. Both the cold and the hot fits, about the exposition of which such a theory is alone concerned, are themselves accidents, since in the most formidable and dangerous forms of fever, the supposed relation between these phenomena is not only constantly disturbed, but often the phenomena themselves do not occur, it being one of the very characters of some of the intensest fevers, that the temperature is little changed, and that the diminished temperature which may be, or which may have been present, is never succeeded by any increase of heat. The true theory of this, as of every other disease, must be sought in the study of its pathology, and can be found only by comparing the pathology of the organs ascertained to be affected with their physiology. The cold stage of fever, when it exists, is produced by a disturbance of the functions of the circulation and of the respiration, and these functions are disturbed, because the organs in which they have their seat no longer receive their accustomed and their requisite supply of nervous influence from the nervous system. The hot stage, when it exists, arises from a disturbance of the same functions: and the reason why we cannot assign with precision why the same cause produces in the one case a diminished, and in the other an increased temperature,

or why the temperature is disturbed at all, is because we do not know with precision on what circumstances in the animal economy the generation of heat depends: when the physiologist has clearly and completely ascertained all the circumstances upon which this process depends, the pathologist will probably have but little difficulty in tracing with equal clearness and completeness the connexion between the disturbance of that process, and the commencement of the febrile state.

In conclusion, then, the doctrine of fever which appears to approximate most nearly to the truth, may be summed up in few words. The immediate cause of fever is a poison, which operates primarily and specifically upon the brain and the spinal cord. The diseased state into which these organs are brought by the operation of this poison, deprives them of the power of communicating to the system that supply of stimulus (nervous and sensorial influence) which is requisite to maintain the functions of the economy in the state of health. The organs, the seats of the functions, deprived of their supply of nervous influence, become deranged, the derangement in each taking place in a fixed order, and in a determinate manner. Subsequently to the nervous and the sensorial, the organs the next to suffer are those of the circulation; then those of respiration; and, ultimately, those which belong to secretion and excretion. The condition of the nervous system which produces this derangement

in this circle of organs, occasions further, in that portion of the circulating system which consists of the capillary blood-vessels, that peculiar state which constitutes inflammation: hence inflammation is almost always established in one or more of the organs comprehended in the febrile circle, and sometimes in all of them. The peculiar and primary affection of the nervous system, which is here assigned as the cause of inflammation, does not become identical with inflammation, but superadds the morbid condition of inflammation to its own; does not lapse into or terminate in the inflammatory state, but accompanies it, and by this combination modifies in a peculiar manner the inflammatory process.

The great practical conclusion to be deduced from this doctrine of fever is, that while the inflammatory processes that are thus set up in so many important organs, greatly aggravate the severity of the disease, and ought to be constantly kept in the view of the practitioner, both on account of their own peculiar danger, and also because they are perhaps the only real states over which he has any control, yet that these inflammatory processes do not alone constitute fever; that their removal, though essential to the cure, will not complete the cure; that another, a primary, and a most formidable disease, is at the same time to be contended with, and that the presence of this distinct and primary disease requires very important modifications in the treatment of the inflammatory condition.

CHAP. VIII.

Of the Causes of Fever.

The causes of fever are of two kinds; first, those which immediately produce the disease, and secondly, those which bring the system into a condition capable of being affected by the first: the former, are called the exciting, the latter, the predisposing causes: a third has been spoken of in relation to this as well as to other diseases, namely, the proximate. But what is really meant by the proximate cause of disease (if the term have any meaning) is the condition of the organ, or of the system, produced by the operation of the exciting cause: this term, therefore, designates an effect, not in any proper sense, a cause: it relates to the disease itself, not to that which produces it.

I. Of the Immediate, or Exciting Cause of Fever.

The immediate, or the exciting cause of fever is a poison formed by the corruption or the decom-

position of organic matter. Vegetable and animal matter, during the process of putrefaction, give off a principle, or give origin to a new compound, which, when applied to the human body, produces the phenomena constituting fever. What this principle or compound is, whether it be one of the constituent substances which enter into the composition of organised matter, or whether the primary elements of organised matter, as they are disengaged in the process of putrefaction, enter into some new combination, and thus generate a new product, we are wholly ignorant. Of the composition of the poison, of the laws which regulate its formation, and of its properties when generated, we know nothing beyond its power to strike the human being with sickness or death. We know that, under certain circumstances, vegetable and animal substances will putrefy: we know that a poison capable of producing fever will result from this putrefactive process, and we know nothing more.

Of the conditions which are ascertained to be essential to the putrefactive process of dead organic substance, whether vegetable or animal, those of heat and moisture are the most certain, and as far as we yet know, the most powerful. Accordingly, in every situation in which circumstances concur to produce great moisture, while the heat is maintained with some steadiness within a certain range, there the febrile poison is invariably generated in large

quantity, and in great potency. Wherever generated, we have no means of ascertaining its existence but by the effects it produces on the human body. Now and then circumstances arise which illustrate these effects in an exceedingly striking manner. This is the case when large numbers of men, previously in a state of sound health, are simultaneously exposed to it. Examples of such occurrences, as numerous and as complete as can can be desired, were long since recorded, among many others, by one very accurate observer, who is of the number (no small one) of those who have given valuable lessons to the world, which have been forgotten, and to which it is a useful labour to recall the attention of the present age.

"In the beginning of June, 1742," says Sir John Pringle, in his Observations on the Diseases of the Army, "the British troops began to embark for Flanders. There were in all, of foot and cavalry, about 16,000: the winds were favourable, the several passages short, the men landed in good health, and went into their several garrisons. The head-quarters were at Ghent. During the Summer and Autumn the weather was good, the heats moderate, and the country in general healthy. The British officers continued well, but many of the common men sickened. Ghent is situated between the high and the low division of Flanders; one part

of the town called St. Peter's Hill, is much higher than the rest, and in this, the barracks, having drains and free air, were quite dry; so that the soldiers who lay there enjoyed perfect health. But those who were quartered in the lower part of the town (mostly on the ground-floors of waste houses, unprovided with drains, and of course damp) were sickly. The batallion of the first regiment of guards was a remarkable instance of this difference of quarters. Two of the companies lay on St. Peter's Hill; the remaining eight in the lower part of the town, in rooms so very damp, that they could scarce keep their shoes and belts from moulding. In the month of July, the sick of this battalion amounted to about 140; of which number only two men belonged to the companies on the hill, and the rest to those in the lower town."*

It is further stated, that in the end of August, Ostend having surrendered, the garrison, consisting of five battalions British, was conducted to Mons, where they continued about three weeks: that these men had been so healthy that, when they marched out, upon the capitulation, they left only ten sick; but that the same corps having been put into damp barracks at Mons, while the town was surrounded with an inundation, fever immediately

* Observations on the Diseases of the Army, by Sir John Pringle, Bart., p. 11. et seq.

appeared, and prevailed to such an extent, that in this short space of time 250 were seized with the disease.*

Of the campaign in 1748, it is stated that the troops had scarcely been a month in the cantonments, when the returns of the sick amounted to 2000: that afterwards the number became much greater: that those who were near the marshes suffered by far the most, both in the number and the violence of the symptoms; that the Greys, cantoned at Vucht (a village within a league of Bois-le-duc, surrounded with meadows, either then under water, or but lately drained) were the most sickly; that for the first fortnight they had no sick, but, after continuing five weeks in that situation, they returned about 150; after two months, 260, which was about half the regiment; and at the end of the campaign, they had in all but 30 men who had never been ill: that a regiment at Nieuland, where the meadows had been floated all Winter, and were but just drained, returned sometimes above half their number: that the Scotch Fuzileers at Dinther, though lying at a greater distance from the inundations, yet being quartered in a low and moist village, had above 300 ill at one time, while a regiment of dragoons, cantoned only

* Observations on the Diseases of the Army, by Sir John Pringle Bart., p. 36.

half a league south-west of Vucht, were in a good measure exempted from the distress of their neighbours, such was the advantage even of that distance from the marshes, of the wind blowing mostly from the dry grounds, and of a situation upon an open heath, somewhat higher than the rest.

When the troops were in Zealand, where the poison was in a high degree of concentration, they had not been a fortnight in the cantonments, before several of the men belonging to those regiments which were stationed nearest the inundations, were seized simultaneously with lassitude and inquietude, a sensation of burning heat, intense thirst, frequent nausea, sickness and vomiting, aching of the bones, pain in the back, and violent head-ache. There were some instances of the head being so suddenly and violently affected that, without any previous complaint, the men ran about in a wild manner, and were believed to be mad, till the solution of the fit by a sweat, and its periodic return, discovered the true nature of their delirium. Most of the men were first taken ill upon their return from forage. The regiment being cantoned close upon the inundations, and many of the quarters being above two leagues from the place where the magazines were kept, the men were obliged to set out about four in the morning, in order to get back before the greatest heat of the day. At this early hour, the meadows and marshes

on each side of the road were covered with a thick fog, of an offensive smell. The party generally returned before noon; but several of the men, even before they could get back to their quarters, were already in a violent fever; some, in this short space of time, were actually delirious; and a few, on their way home, were so suddenly taken with a phrenzy, as to throw themselves from their trusses into the water, imagining they were to swim to their quarters. One man, on reaching home, was suddenly seized with intense head-ache, got out of his quarters, and ran about the fields like one distracted. Three years after this sickness, it was found that two of the men who were thus suddenly affected with phrenzy, though they recovered of their fever, had ever since been epileptic, and that all the rest who had been ill, remained exceedingly liable to returns of an intermitting fever.

The suddenness with which fever sometimes attacks individuals on board a ship, or even an entire ship's crew, on the approach of the vessel to a shore where this poison is generated in large quantity, and in a high state of concentration, illustrates its operation, perhaps, in a still more striking manner. Dr. Macculloch, who has laboured with great ability and zeal to recall attention to the most important and long-forgotten subject of malaria, relates an instance of some men on board a ship, who were seized, while the vessel was five miles from shore with fatal cho-

lera, the very instant the land-smell first became perceptible. Several of these men, who were unavoidably employed on deck, died of the disease in a few hours. The armourer of the ship, who, before he could protect himself from the noxious blast, was accidentally delayed on deck a few minutes, to clear an obstruction in the chain cable, was seized with the malady while in that act, and was dead in a few hours.

Dr. Potter states* that he witnessed the rise of a most malignant yellow fever, in a valley in Pennsylvania, which contained numerous ponds of fresh water, and which, from the heat and dryness of the season, emitted a most offensive smell: that the fever prevailed most, and with the greatest degree of malignity among the people who lived nearest these ponds; and adds an exceedingly instructive case, illustrative of the generation and operation of this cause of fever, recorded by Major Prior, in his account of a fever which attacked the army of the United States at Galliopolis. The source of the malady was clearly traced to a large pond near the cantonment. When the disease was most severe, it assumed the continued form, and was accompanied with yellowness of the skin: when proper means were taken to destroy the pond, the fever immediately lost its

* See a Memoir on Contagion, more especially as it respects the Yellow Fever, &c. by N. Potter, M. D., Baltimore.

continued form, and became first remittent, then intermittent, and ultimately disappeared. "The fever," says this intelligent officer, "was, I think, justly charged to a large pond near the cantonment. An attempt had been made two or three years before to fill it up, by felling a number of large trees that grew on and near its margin, and by covering the wood thus fallen with earth. This intention had not been fulfilled. In August, the weather was extremely hot, and uncommonly dry: the water had evaporated considerably, leaving a great quantity of muddy water, with a thick slimy mixture of putrefying vegetables, which emitted a stench almost intolerable. The inhabitants of the village, principally French, and very poor, as well as filthy in their mode of living, began to suffer first, and died so rapidly, that a general consternation seized the whole settlement. The garrison continued healthy for some days, and we began to console ourselves with the hope that we should escape altogether: we were, however, soon undeceived, and the reason of our exemption heretofore was soon discovered. The wind had blown the air arising from the pond from the camp; but, as soon as it shifted to the reverse point, the soldiers began to sicken: in five days, half the garrison was on the sick list, and in ten, half of them were dead. They were generally seized with a chill, followed by head-ache, pains in the back and limbs, red eyes,

constant sickness at stomach, or vomiting, and generally, just before death, with a vomiting of matter like coffee-grounds. They were often yellow before, but almost always after death. The sick died generally on the seventh, ninth, and eleventh days, though sometimes on the fifth, and on the third. As some decisive measures became necessary to save the remainder of the troops, I first thought of changing my quarters, but as the station was in every respect more eligible than any other, and had been made so by much labour and expense, I determined to try the experiment of changing the condition of the pond, from which the disease was believed to have arisen. A ditch was accordingly cut; what little water remained was conveyed off, and the whole surface covered with fresh earth. The effects of this scheme were soon obvious. Not a man was seized with the worst form of the fever after the work was finished, and the sick were not a little benefited, for they generally recovered, though slowly, because the fever became a common remittent, or gradually assumed the intermitting form. A few cases of remitting and intermitting fever occurred occasionally, till frost put an end to it in every form. As soon as the contents of the pond were changed, by cutting the ditch, the cause, whatever it was, seems to have been rendered incapable of communicating the disease in its worst form."

Dr. Potter further states that, on one occasion,

he saw a lady, who had been confined three days only, and whom he found in the agonies of death, with the skin of a deep orange colour, the eyes red and prominent, the pulse intermittent, and ejecting copiously from the stomach every eight or ten minutes, the secretion now known by the name of the black vomit; that she expired in a convulsion, while he sat at her side; that petechiæ appeared immediately after death, and that putrefaction succeeded so rapidly, that it was necessary to order immediate interment: that, shortly afterwards, he was called to a gentleman who had been ill five days, and who, having expired in an hour or two after his visit, was removed into the coffin with the utmost difficulty, the flesh literally dropping from the bones: that, in one family residing in a house which stood on a level piece of ground, apparently beyond the reach of noxious exhalation, there being no stagnant water, as was supposed, within a mile of it, he found the mother labouring under a bilious remitting fever, which had continued eleven days; the daughter, seventeen years of age, suffering from a similar fever; two sons, the one between eight and nine, and the other six, ill with dysentery; and the father, on the brink of the grave, from a most malignant fever. There being no apparent cause for the condition of this afflicted family, the immediate neighbourhood of the house being free from the ordinary sources of malaria,

and the adjacent country being not unhealthy, the condition of the house itself was minutely investigated. The cause of the evil was manifest. It appeared that the present family had resided in the house only about five weeks; that immediately preceding their occupation of it, a man had died suddenly in it; that he himself (Dr. Potter) was seized with nausea and general lassitude, immediately on leaving the house after his first visit; and that a fever, as he supposes, was arrested by a strong dose of tartarized antimony, which operated violently by vomiting and purging. On examining the premises, it was found that the cellar contained water about two feet deep, which had remained there from the first week in June, the country having been then inundated by torrents of rain. The cellar being useless, the door had been closed, and the only vent for the pestiferous gases was through the floor, which was open in several places. The family being immediately removed, all the sick became convalescent from the time they ceased to breathe the air of the place. The owner of the house hired two men to empty the cellar. These men having ripped up the floor, and placed a pump in the deepest part of the water, evacuated the cellar to the dregs in one day. On the second day after the execution of this task, one of these men was seized with a chilliness, succeeded by an ardent fever, which terminated with the usual symptoms

of yellow fever; namely, hæmorrhages, yellow skin and petechiæ, and proved fatal on the third day from the attack: the day following the seizure of the first, the second man was attacked with similar symptoms, and died on the seventh day of the disease, with the black vomit, in addition to the ordinary symptoms of the yellow fever.

These examples may suffice to illustrate the operation of that febrile poison which arises chiefly from the decomposition of vegetable matter. The poison derived from the putrefaction of animal matter is still more pernicious: its effects are more powerful in degree, and worse in character; it operates more intensely on the nervous system, and less on the vascular; and the fevers it produces are invariably of the typhoid type, and of the continued form.

Without doubt, a febrile poison, purely of animal origin, in a high degree of concentration, would kill instantaneously; and when not intense enough to strike with instantaneous death, it would produce a continued fever with the typhoid characters, in the greatest possible degree of completeness and perfection. And this appears to afford the true solution of the origin of the plague. The more closely the localities are examined of every situation in which the plague prevails, the more abundant the sources of putrefying animal matter will appear, and the more manifest it will become, not only that such matter must be present, but that it must abound.

And this also is one of the truths which was known to the observers of former times, but which has been forgotten. Were it not that the professional reading of an age, is bounded by as strict a line as that which divides century from century; were it not that no one reads back beyond the authority which happens to give to the day its prevailing doctrines; were it not that the great repository of facts treasured up in the volumes of the close observers, though sometimes the bad reasoners of former days, thus becomes neglected for the dogmas of some modern writer, who reasons as ill, and who observes less, the notion that vegetable malaria produces only intermittent fever, never could have become so prevalent as it is at present, nor could the influence of animal malaria ever have been so entirely overlooked. But it chanced that Cullen, in his definition of intermittent fever, assigned the miasma of marshes as the origin of the disease, while he makes no mention of animal malaria in his definition of any of the forms of fever; and as this author superseded all former authorities, by becoming the great authority of the age, few of his successors are acquainted in the slightest degree with the writings anterior to his period: whence it has happened that the numerous and invaluable facts observed and recorded by his predecessors, relative to the cause of fever, have been disregarded until they have become wholly unknown. To cite the ancient and the more mo-

dern authorities who have observed and recorded the influence of animal malaria in the product of plague, would be to enumerate every distinguished writer, from Pliny and Diodorus Siculus, down to Galen, from Galen to Mead, and from Mead to Pringle.

In assigning the reason why Grand Cairo, in Egypt, is the birth-place and the cradle of the plague, Mead states that this city is crowded with vast numbers of inhabitants, who live not only poorly, but nastily; that the streets are narrow and close; that the city itself is situated in a sandy plain, at the foot of a mountain, which keeps off the winds that might refresh the air; that consequently the heat is rendered extremely stifling; that a great canal passes through the midst of the city, which at the overflowing of the Nile is filled with water; that on the decrease of the river, this canal is gradually dried up, and the people throw into it all manner of filth, carion, offal, and so on; that the stench which arises from this, and the mud together, is intolerably offensive; and that, from this source, the plague constantly springing up every year, preys upon the inhabitants, and is stopped only by the return of the Nile, the overflowing of which washes away this load of filth: that in Ethiopia the swarms of locusts are so prodigious, that they sometimes cause a famine, by devouring the fruits of the earth, and when they die, create a pestilence, by

the putrefaction of their bodies; that this putrefaction is greatly increased by the dampness of the climate which, during the sultry heats of July and August, is often excessive; that the effluvia which arise from this immense quantity of putrefying animal substance, combined with so much heat and moisture, continually generate the plague in its intensest form; and that the Egyptians of old were so sensible how much the putrefaction of dead animals contributed towards breeding the plague, that they worshipped the bird Ibis, from the services it did in devouring great numbers of serpents, which they observed injured by their stench when dead, as much as by their bite when alive.

Nothing can be more striking than the cases recorded by Pringle, and which daily occurred to him of the production of fever, exquisitely typhoid, (according to the language of that day, jail and hospital fever) and of the sudden transition of intermittent and remittent into the continued and typhoid type, from the presence of a poison clearly and certainly of animal origin. Whenever wounded soldiers, with malignant sores, or mortified limbs, were crowded together, or whenever only a few of such diseased persons were placed in a room with the sick from other diseases, with those labouring under intermittent and remittent, for example, a severe and mortal typhus immediately arose; nay, whenever men, previously in a state of sound health, were too

much crowded together for any considerable time, typhus (jail or hospital fever) was sure to be produced. The instances of such occurrences that are detailed, are too numerous to be cited, but they are so clearly stated, and so striking, that they well deserve to be consulted by whoever is desirous of clearly tracing the operation of this great cause of fever.

But by far the most potent febrile poison, derived from an animal origin, is that which is formed by exhalations given off from the living bodies of those who are affected with fever, especially when such exhalations are pent up in a close and confined apartment. The room of a fever-patient, in a small and heated apartment in London, with no perflation of fresh air, is perfectly analogous to a stagnant pool in Ethiopia, full of the bodies of dead locusts. The poison generated in both cases is the same; the difference is merely in the degree of its potency. Nature, with her burning sun, her stilled and pent-up wind, her stagnant and teeming marsh, manufactures plague on a large and fearful scale: poverty in her hut, covered with her rags, surrounded with her filth, striving with all her might, to keep out the pure air, and to increase the heat, imitates nature but too successfully; the process and the product are the same, the only difference is in the magnitude of the result. Penury and ignorance can thus at any time, and in any place, create a mortal plague. And of

this no one has ever doubted. Of the power of the living body, even when in sound health, much more when in disease, and above all, when that disease is fever, to produce a poison capable of generating fever, no one disputes, and the fact has never been called in question. Thus far the agreement among all medical men, of all sects, and of all ages, is perfect.

But it happens that there is another form of animal matter capable of producing fever: namely, a matter secreted by the living body, constituting not only a poison, but a peculiar and specific poison. This specific poison produces not merely fever, but fever with a specific train of symptoms. In the acknowledgment of this fact, also, the agreement among all medical men is equally perfect.

But some contend that the poison generated in the first case, and that generated in the second, may both be properly called contagions: others maintain that the application of the same term to two cases so specifically different, destroys a distinction which it is useful to preserve, and that it would be more correct, as well as more conducive to clearness of conception, to call the poison generated in the first case an infection, and to restrict the term contagion, to designate the poison generated in the latter. Vast and immeasurable as the difference appears to be between the contagionists and the anti-contagionists, if regard be had merely to their language,

yet if attention be paid only to their ideas, to this, and to this only, narrow as the compass is, the whole controversy is reduced. It resolves itself wholly into the question, whether one word shall be used to express two cases which differ from each other in some important circumstances, or whether it may not be more convenient to employ two terms, and strictly to appropriate each to designate its own specific class. It must be manifest that, since both sects are perfectly agreed about the facts, the dispute can be only verbal. If the one would consent to restrict their use of the term contagious, for which there is the best authority and ancient custom, to those diseases which arise from a specific contagion, and would call those which arise from every other poison infectious, there would be an end to this apparently interminable, and in many respects mischievous, controversy.

Is the febrile poison, whether of vegetable or animal origin, or whether composed of both, capable of adhering to clothes, apparel, and other substances, in such a manner as truly to infect them, so that when applied to the bodies of the healthy, at any distance of place, and at some distance of time, the specific effects of the poison are produced? That such substances may be so imbued with the poison of the small-pox, all admit: that the evidence should not be as complete relative to the power, or the inability of such substances to

convey and communicate the poison of ordinary continued fever, is alike disgraceful to the state of our science, and injurious to the cause of humanity. There is no reason why the question should not be settled with absolute certainty; there is no manner of difficulty in determining it. Experiments the most direct, complete, and decisive, might be performed, which, if observed, during their progress, by competent witnesses, and duly authenticated, might ascertain the point with sufficient clearness and certainty, to satisfy not only the present age, but future generations. Once, for all, the full trial might be made, and if the trial were really full, it need never be repeated. A series of experiments completely decisive of the question, as far as regards the fever of our own country, which might be easily extended to the plague, were some time ago drawn out, and exertions were made to carry them into effect; but in the prevailing state of public opinion and feeling, it was found absolutely impossible to institute them on a scale at all adequate to render them decisive, without the aid of Government. There seems to be no possible mode of performing them effectually, unless Government will co-operate, by granting a free pardon to such convicts, as will voluntarily allow themselves to be made the subjects of them. The risk to them would be slight, the evil to the community none; while the danger, the suffering, the disease, the mortality that would be

prevented, to say nothing of the expense that would be spared by the decision of the question, would be incalculable. It is earnestly to be hoped that those who have it in their power to afford the means of putting this question at rest, will not allow it to remain in its present unsettled state. Science, commerce, humanity, alike demand that the truth should be ascertained.

This subject, it is my intention to take up, and to discuss fully in a future publication, in which will also be investigated some inquiries, which it has been found impossible to include in the present volume; such as whether the vegetable and animal poison we have been considering, be the only true exciting cause of fever; by what means its general diffusion is effected; on what conditions its propagation depends; by what measures its extension may be checked, and its power diminished or destroyed; what circumstances in the modes of life, in the habits of society, in the structure of houses, in the condition of the public streets and the common sewers, in the state of the soil over large districts of the country, as influenced by the mode of agriculture, drainage, and so on, favour or check the origin and propagation of this great curse of civilized, no less than of uncivilized man. It is obvious that these inquiries will include the investigation of several exceedingly curious and important statistical questions; and the object of these researches will be accom-

plished should they lead to the establishment of any useful principles of extensive application.*

II. Of the Remote or Predisposing Causes of Fever.

The remote or the predisposing causes of fever have been stated to be those circumstances which bring the body into a condition capable of being affected by the immediate or the exciting cause. Whatever diminishes the vigorous action of the organs, impairs their functions, and so weakens the general strength of the system, is capable of becoming a predisposing cause of fever; and every predisposing cause acts in one or other of these modes, and becomes a predisposing cause only and in proportion as it lessens the energy of the system, or disturbs the balance of its actions, which in fact is to render some portion of it weak. During a state of vigorous health the body is endowed with the power of resisting the influence of noxious agents, which in a less perfect state of health are capable of producing intense and fatal disease; and the action of all predisposing causes is to lessen this resisting power, or to weaken the energies of life.

* In pursuing these researches, I hope to have the advantage of the co-operation of my friend Dr. Dill.

Of all predisposing causes, the most powerful is the continued presence and the slow operation of the immediate or the exciting cause. It is a matter of constant observation, that the febrile poison may be present in sufficient intensity to affect the health, without being sufficiently potent to produce fever. In this case the energy of the action of the organs is diminished, their functions are languidly performed, the entire system is weakened, and this increases, until at length the power of resistance is less than the power of the poison. Whenever this happens, fever is induced; not that the power of the poison may be at all increased; but the condition of the system is changed, in consequence of which, it is capable of offering to the noxious agent that assails it less resistance.

We have seen that the vegetable or animal poison may exist in sufficient intensity to produce fever on the slightest exposure to it, without the operation of any predisposing cause, in a body in the state of the soundest health, and endowed with the greatest degree of strength. Examples of this kind are but too frequent in tropical climates. In countries where the temperature never rises so high, and seldom continues so long, it is rare that fever is produced immediately, on exposure to the exciting cause. Concentrated and potent as that poison is in many parts of Flanders, yet Sir John Pringle states that, in removing to an unhealthy situation, the men rarely became ill at once; that they generally continued in tolerable

health for some days; and that recruits recently arrived in the country, resisted the noxious agent longer than the men who had been long there. Dr. Potter gives a remarkable example of the same fact, with regard to the yellow fever, which fell under his own observation, and states other facts, strikingly illustrative of the influence and operation of the predisposing causes. Strangers, from certain countries, he informs us, are insusceptible of yellow fever in America. In the most malignant and protracted epidemics which afflict that country, these strangers uniformly escape: emigrants from the West Indies, and other warm latitudes, for example, invariably resist the cause which produces these maladies in the native inhabitants. But the curious fact is, that such persons are unable permanently to resist the operation of the exciting cause; for, after a residence in America of some years, their constitution is so completely assimilated by the influence of the climate to that of the American, that they become equally sensible to its febrile miasma, and are as exquisitely impressed by them, as the American citizens themselves. The illustration is equally striking and instructive, if the position be reversed. The natives of northern climates are extremely susceptible to the influence of these miasma; that susceptibility is in exact proportion to the latitude of their country: those from the north of Europe scarcely ever escape an attack; the

natives of Great Britian are nearly as susceptible to the influence of the poison, while persons even from the more northern countries of the United States are more liable to the disease than the citizens of the southern and middle states.

Dr. Potter performed some experiments, to show that the continual presence of the exciting cause not only operates upon the general system, but actually produces a morbid change in the blood, before it induces fever. During the prevalence of an epidemic, it was observed that, in all the cases in which the patients were bled, the general appearance of the blood was precisely the same; that the coagulum was either of a yellow, or of a deep orange colour, and that a portion of the red particles was invariably precipitated. It occurred to Dr. Potter that, if the cause of the disease were contained in the common atmosphere, the blood of those who had inhaled it a certain time would exhibit similar phenomena; and that, should this be the case, it would prove that the cause, before actually producing the disease, brought about a state of the system, which predisposed it to be affected by the poison. To ascertain the appearances of the blood in persons who were exposed to the febrile poison, but who still remained apparently in perfect health, he drew a quantity of blood from five persons, who had lived during the whole epidemic season in the most infected parts of the city. To external appearance and inward feeling, each of these persons was in sound health.

Their blood could in no respect be distinguished from the blood of those who laboured under the most intense forms of the prevailing fever. As it was necessary to the conclusiveness of the experiment that their blood should be compared with the blood of those who lived in an atmosphere unquestionably pure, Dr. Potter selected an equal number of persons who dwelt on the hills in Baltimore county, and drew from each of them ten ounces of blood. The contrast was most manifest. The serum was neither of a yellow, nor of an orange colour; there was no red precipitate; the appearances were such as are found in the blood of persons in perfect health.

A young gentleman having returned to the city from the western part of Pennsylvania, on the 10th of September, in a state of sound health, Dr. Potter drew a few ounces of blood from a vein, on the day of his arrival; it exhibited no deviation from that of a healthy person. He remained in the family until the 26th of the month, that is sixteen days. On the 16th day the bleeding was repeated. The serum had assumed a deep yellow hue, and a copious precipitation of red globules had likewise fallen to the bottom of the vessel.

In these experiments, the blood in six persons indicated the operation of the morbid cause, while each remained in a state of apparent health. Of these six persons, four were actually seized with yellow fever during the prevalence of the epidemic;

and the other two, though they escaped any formal attack, did not escape indisposition. They were affected with head-ache, nausea, and other indications of disease, like hundreds besides, who were never absolutely confined to the house, and who never took any medicine, but who still experienced in nausea, giddiness, head-ache, pain in the extremities, and so on, abundant intimations of the presence of the poison.

These examples may suffice to show how the exciting, may itself become a most powerful predisposing cause. The predisposition to subsequent attacks, after the system has once suffered from the disease, is very remarkable; that predisposition remains for a considerable period after convalescence and apparent recovery. Of this, striking examples continually occur both with regard to intermittent, and to continued fever. In fact, the disposition to relapse, remains until the constitution has recovered its previous strength and vigour, however distant that period may be. The influence of cold, moisture, fatigue, intemperance, constipation, anxiety, fear, and all the depressing passions, are likewise extremely powerful predisposing causes. They enable a less dose of the poison to produce fever, and they increase the intensity of the fever when it is established. They all act by weakening the resisting power inherent in the constitution, that is, by enfeebling the powers of life.

CHAPTER IX.

Of the Treatment of Fever.

We have seen that the first indication of disease in fever is traceable to the nervous system; that the nature of this primary affection of the nervous system is unknown; that it may possibly be the commencement of inflammation, modified by the nature of the nervous substance, in which the inflammatory action has its seat, and by the nature of the cause that excites it, namely, a peculiar poison: or, on the other hand, it may possibly be something distinct from inflammation, but having a peculiar tendency to excite it. In either case, the inflammation that is present in fever, is peculiar and specific, differing essentially from ordinary or simple inflammation. Whether the affection of the nervous system consist merely of inflammation of the nervous substance excited by a peculiar poison; or whether it consist of some unknown condition of the nervous system to which inflammation is superadded, and by which the character of that inflammation is modified, the great practical result is the same,

namely, that febrile inflammation and ordinary inflammation are not identical, and that the difference btween the two affections is such as to require a very considerable modification in the treatment appropriate to each.

The only morbid condition of fever, of which we have any knowledge, and over which the medical art has any control is that of inflammation. Although, as has been so often stated, inflammation be not the primary febrile affection, as far as regards the order of events, yet it is, at least, the primary affection, as far as regards the treatment, if it be not the sole affection that admits of treatment. The remedies proper for febrile inflammation do not differ from those which are adapted to ordinary inflammation; but they differ materially in the mode in which they ought to be applied, and the extent to which they ought to be carried. They can be understood neither in their mode nor measure, until the following questions are determined; namely, What is the precise object that should be aimed at in the treatment of fever? What is it which it is most important to do, and which it is in the power of the medical art to accomplish? An exact and true answer to these questions will afford an invaluable guide in practice: it will point out with clearness what is to be attempted; and it will put a stop to useless and pernicious aims.

It is in vain to hope to terminate fever by a stroke of art. The pursuit of a remedy, so long and so earnestly sought, endowed with the power of cutting short the disease, is to the physician what the search after the philosopher's stone was to the alchymist, with this difference, that the alchymist, engaged in a vain pursuit, lost only his time and labour; but the physician, engaged in a pursuit equally hopeless, will often, in addition, lose his patient. Fever cannot be cured instantaneously; and to bring a fever-patient under the influence of agents capable of exciting a powerful influence upon the system, in the expectation of at once removing fever, is pregnant with danger; and the expectation upon which such practice is adopted, must appear fallacious to whoever has studied the nature of the disease.

Fever cannot be cured instantaneously: it may be moderated; it may be gradually subdued; from being violent and dangerous, it may be rendered mild and safe: the physician may bring it to this condition; and this is all that he can accomplish. If it come under his care early, and he know with promptitude and decision at what to aim, he will rarely fail in his efforts to secure this object.

Since the various forms or types of fever differ in nothing but the degree of their intensity, in detailing the treatment, it will be necessary only to state first of all, the remedies which are appropriate to the

disease; and, secondly, the modification of these remedies, which may be required by the different degrees of intensity in which it is commonly found to exist.

1. The common continued fever of this country, in its mildest form, requires little or no treatment. There is no affection of any organ intense enough to need the application of a powerful remedy. All the organs which constitute the febrile circle are deranged in their functions, but that derangement is so slight that a cure takes place spontaneously in the course of a few days. Confinement to the bed; the abstraction of stimuli; fever diet; a calomel purgative at night, consisting of one or two grains of calomel with six or ten of rhubarb, followed in the morning with half an ounce of castor oil; and these remedies repeated every day, or every alternate day, constitute the whole treatment which is required.

2. Whenever the fever passes beyond this, its mildest form, it becomes a serious disease. It is never for a moment to be trifled with; never for a moment to be neglected. Because it is moderate in the commencement, it is not to be presumed that it will continue moderate through its subsequent course: it may become most formidable; if the proper remedies are not applied early and vigorously, it generally does become truly alarming; the train only is apparent; the mine is concealed; the only safety

for the patient is to prevent the train from being kindled; if that be once kindled, it may be no longer possible to save the patient from destruction.

When the mildest case of fever passes to a severer form, what is the event that happens? What is the change that takes place in the organs? The preceding pathology will, indeed, have been written in vain, if there can now be any doubt in the mind of the reader on that point. The great value of the facts there disclosed is, that they teach us what happens in organs which we cannot see, and declare to us by the external signs or symptoms, the internal actions that are going on. Out of the hundred cases which have now been recorded, and the history of which has been made known from its commencement to its termination, take any one, or fix upon any number, in which the symptoms from being slight became moderate, and from moderate severe, or, in which the symptoms were severe from the beginning, what is found after death? Inflammation, in general, rising in degree, and increasing in extent, or both, in proportion to the intensity of the febrile affection. If this, which may be justly considered as the law of the disease, be not absolutely constant and uniform, it may be safely affirmed, at least, that there are as few apparent exceptions to it, as to any general law that can be named.

The object to be aimed at in practice, then, is clear: it is to prevent, or to remove inflammation,

Accomplish this, the fever will not be cured at once; it will still go on for some time; but it will come sooner to a close, and it will proceed mildly and safely to its termination. Fail to accomplish this, and the fever, however mild at first, will increase more and more in severity until it become truly formidable, and death take place at last, in consequence of the destruction of the organs by the process of inflammation.

If excitement be set up in an organ which has as invariable a tendency to terminate in inflammation as a stone to fall to the ground, what is the proper remedy to prevent the transition of excitement into inflammation? Bleeding. Before we can say that inflammation is established we may foresee that it will come: if the preceding excitement be not stopped, we know that it will as surely come as that blood will flow from a wounded blood-vessel. Because we cannot tell the precise moment when increased vascular action passes into actual inflammation, are we quietly to look on and do nothing until we have made that discovery? We know that inflammation is at hand; we know what will prevent it, or, at any rate, what has a powerful tendency to prevent it: shall we not bring into immediate and vigorous use our means of prevention, or shall we wait until the inflammatory action shall have given unequivocal and alarming indications of its presence and operation before we interfere? To trifle in such

a manner, to lose these precious moments when we have such a fearful, such an active, and, if once it be allowed to become active, such a masterless enemy to contend with as fever, is as great a folly as it would be when a building is on fire to stand idle by as long as the fire is smouldering, and to take no measure to extinguish it until it has burst into flame, nay, not until the flame has spread from the floor to the ceiling, and from the ceiling to the roof. We may not be ablé to see a single spark, but if we see the smoke and feel the heat, we know that there is fire somewhere, and that however concealed at present it will soon make itself visible enough, and that it will consume not only the structure in which it originates, but others with which it may come in contact if it be not put out. With equal certainty we know that fever, though apparently mild in the commencement, will excite inflammation in vital organs, and that that inflammation, if it be allowed to establish itself, will place the fabric of the body in the most imminent danger. The physician, in the first stage of fever, armed with his lancet, is to his patient what the fireman with his engine, before the flames have had time to kindle, is to a building that has taken fire. At this early stage, the former can check inflammation with almost as much ease and certainty as the latter can prevent the flames from bursting out. On the contrary, the physician who it called to treat inflammation in the later stage

of fever is in the position of the man who arrives with the apparatus for saving the house when its stories have been already consumed and its roof has fallen in.

Bleeding in fever cannot be performed too early. The very first moment of excitement, could that be discovered, is precisely the moment when the employment of this powerful remedy would produce the greatest effect. The earlier the bleeding, the greater will be the impression made upon the disease, and the less upon the patient; or, the more effectually will the inflammatory action be stopped by the loss of the smallest quantity of blood.

When inflammation has actually come on, there is then not a moment to be lost; that inflammation must be stopped; the accomplishment of this object is the great end which the practitioner should aim at in every thing he attempts; until he has done this he has done nothing; until he has done this he ought to give neither sleep to his eyes nor slumber to his eyelids; until he has done this he ought to feel that there should be no rest for himself, because there is no safety for his patient. Until the inflammation is subdued blood must be taken; be the quantity it may be necessary to abstract, in order to accomplish this object, what it may; be the bleedings it may be requisite to repeat what they may; the vein must be allowed to flow, and it must be opened again and again until this object is se-

cured. If this golden opportunity be allowed to escape, and this object be not obtained, the risk is most imminent. During this early period the physician is master over the disease; if he allow it to pass away without obtaining the victory, the disease becomes master over the physician. From that moment his control over it is gone. Never can he regain his lost advantage. Fever is a process that advances with a step as steady as time, and like time it never retraces a step. At a subsequent period its progress may be sometimes retarded, and now and then it may be weakened; but, after the lapse of a few days, this is all which the most complete success is then capable of accomplishing.

Mere relief of inflammation is nothing; to render a severe inflammation a less severe inflammation is to do nothing; because the less severe inflammation may be fatal just as certainly as the more severe: the inflammation must be subdued, or the case, if not wholly lost, becomes dangerous and doubtful.

The abstraction of blood must be carried to the extent of subduing the inflammation: there is no other limit to the quantity to be taken but that which is adequate to subdue the inflammation. To attempt to measure the quantity by drachms or ounces is wholly vain; because, if the remedy be properly employed, the quantity will vary in every individual case. To take an ounce more than the subdual of the inflammation requires is injurious; to take an

ounce less is still more pernicious; to take the quantity necessary to accomplish the object, and no more, is to use the lancet—that powerful instrument, so dangerous in rash hands, and no less dangerous in weak, with the discernment and decision of a master. He who with a knowledge which gives and which justifies boldness and decision, is able thus to employ this great remedy, is a skilful physician, who has derived from study and experience the best fruit they can yield: he who has not yet reached this perfection of his art, (and who among us can pretend to the attainment?) must still go on to observe and to learn.

The object to be accomplished then is clear; that means of obtaining it are known; and when these means are promptly, boldly, and effectually employed, what is the result of experience? That after all, the quantity of blood it is necessary to abstract is not large. The tendency of the preceding observations is not to countenance frequent and large abstractions of blood in fever, but to save the blood of the patient, by taking the due quantity at the proper time. Smaller bleedings will subdue febrile than pure inflammation. Febrile inflammation, as has been so often stated, is a modified inflammation, the modification consisting in less activity in the vascular system and greater depression in the nervous. Whence a moderate bleeding will make an impression upon febrile inflammation

which can be equalled by pure inflammation only by a large bleeding. He who takes away sixteen ounces of blood in fever adopts a bolder and more decisive practice, and brings more effectual relief to his patient, than he who abstracts thirty ounces of blood in some other forms of inflammation; and he who takes away six ounces of blood in one febrile case, does more than he who takes away sixteen in another. But the question never can be whether the bleeding should be small or large: that is nothing. The thing to be considered is the condition of the organs, the state of the system; not the ounces of blood to be taken, nor the number of periods at which it is to be removed. Abstract blood to the subdual of the inflammation—that is the rule; abstract blood at the very commencement of the inflammatory action; if you are in time to do it, at the very commencement of the febrile excitement. Then little blood will be lost, and the patient will be safe. And when this is done, nothing of importance remains to be done. The practitioner who has been thus active in the commencement will be idle during the future progress of the disease. Daily as he repeats his visit he will find that his interference is not required, and will admire to see with what ease a disease of frightful power is disarmed, and rendered innoxious, if it be attacked in infancy, and not neglected or trifled with until it be nurtured to maturity, and allowed, at last, to put forth unchecked the strength of that maturity.

If, after the abstraction of sixteen ounces of blood at the commencement of the attack, the vascular excitement be not completely subdued, in the course of three or four hours the same quantity must be again taken; and if, the next morning, that excitement continue, it will probably have already passed into inflammation; and, therefore, the vein must be once more opened, and the blood allowed to flow until the pain, wherever seated, be entirely removed. To check the disease, instead of subduing it, does not in the least diminish its future strength, and, by weakening the powers of life, it even hastens the period of mortality. Nothing is more common than the appearance of typhoid symptoms, on the second or third day after bleeding has done nothing but lessen the inflammatory action; whereas, had it been carried somewhat, and generally only a little, farther, the patient would have been convalescent at the very period when his danger becomes most imminent. In cases where general bleeding produces a decided impression on the inflammation, but does not stop it, cupping, or even leeches, will often complete what the lancet commenced.

A due impression having been made upon the inflammation by bleeding, the subsequent treatment should consist of purgative medicines, given to the extent of producing three, or at most four stools in the twenty-four hours: beyond that number no advantage is obtained by purging; more frequent eva-

cuations, indeed, weaken the patient, but not the disease. The best purgatives consist of one or two grains of calomel, with six or eight of rhubarb, repeated every night, or every other night, and followed the next morning by two drachms, or half an ounce of castor oil, or by the common senna draught. Cold sponging, if the skin be hot; acidulated drink, if there be thirst; perfect quiet, a dark room, a silent nurse, affording prompt attendance, with a noiseless step, a cheerful countenance, and no words—this, together with three tea-cups full of thin arrow-root or gruel, in the twenty-four hours, given in divided portions, at intervals of about two or three hours, comprises all else that will be required, or that will be useful, until the period of convalescence.

Such is the simple, but most efficient treatment appropriate to the common fever of London and its neighbourhood (and I do not speak of the treatment proper for any forms of the disease as it exists elsewhere, and which I have not seen) in its ordinary degree of severity.*

* It would be trifling, while treating of so momentous a subject as the proper management of fever, which requires the prompt, vigorous, and yet cautious exhibition of the most powerful remedies, to spend any time in discussing the merits of saline, refrigerant, diaphoretic, antimonial medicines, and the rest of the apparatus, which unfortunately continues to hold the place of direct, honourable, and well-earned (if any thing can be well-earned) remuneration to the practitioner.

Suppose, however, the proper treatment not to have been applied; suppose the case to have been neglected or mismanaged; either not to have been seen at all, or to have been too much contemned; suppose the pain in the head to have been not severe; that no complaint was made of it; or that giddiness only was felt; that the skin was not burning hot, but moderately warm; that the pulse was neither strong, nor bounding, nor hard; but of moderate strength, and soft; that the mind was tolerably distinct, and the restlessness not great: why should blood be drawn? what indication is there for the employment of so violent a remedy in so mild a case? No symptom is prominent; no symptom is urgent; the case will do well.

Such is the view that would be taken by the great majority of practitioners of this kind of case, and their treatment, without doubt, would be correspondingly inert. And this is the true origin, in many cases, of typhus symptoms; of adynamic fever. The disease is allowed to take its own course; and the product of every fever, at a certain stage of its process, is adynamia: the physician does not perform his office; the disease advances; the restlessness increases; there is no sleep; delirium comes on; muscular tremor begins to be perceptible; the pulse rises; the sensibility diminishes; and stupor, if it be not already present, is close at hand. And now the disease, it is sufficiently obvious, is severe; now, it is admitted,

it calls for a powerful remedy; and, now for the first time, the lancet is thought of. But the bleeding relieves no symptom; it increases some; the progress of the inflammation is not checked; the adynamic symptoms are more fully developed; the patient is more prostrate, and the fever, in all respects of a worse character: the inference is, that bleeding is a most inefficient and dangerous remedy in fever; and this inference is deduced from experience; those who draw the conclusion, judge from what they see; they disclaim reason; they pretend only to understand and to respect the lessons of experience.

I appeal to the attentive observer, whether this be not a faithful history of the progress and termination of hundreds of fever cases; whether such a history may not be recorded as of daily occurrence; whether what has been stated be not commonly the view, the practice, the result, and the lesson.

I will not appeal to the different history that belongs to cases that are differently treated. But I do earnestly appeal to the pathology that has been stated; that, at least, is experience, and it teaches a lesson, which it is worse than foolish to despise or to forget. Every symptom just enumerated, has been detailed over and over again in the cases that have been laid before the reader: inspection after death must have made the conditions of the organs, as indicated by those symptoms, familiar to his mind.

Of what avail can bleeding be, when the patient is brought into the condition which first excites alarm, in the case here supposed? The blood is no longer in its vessels; it is beneath the membranes, or in the ventricles, or at the base of the brain; the inflamed capillaries have done their work upon the cerebral substance and upon its membranes; and have left proof enough of their activity, in the thickening of the one, and the softening or the induration of the other. What can blood-letting do in this state of the organs? What can shaving the head, and applying cold do? What can blisters do? What can purgatives do? And above all, what can wine do? Nothing can be done; at least, nothing effectually or certainly.

If there be still pain, if the sensibility be little diminished, if the pulse be not very quick and weak, it may yet be possible to check the further progress of the inflammation; to prevent the disorganization of the brain from advancing; but the means to accomplish this, must now be tried with the most extreme caution: perhaps, in the whole compass of medical practice, there is no case which requires a nicer discrimination than this, when it has arrived at this point. The abstraction of a few ounces of blood may stop the inflammatory action of the vessels before they have produced such a change of structure as is incompatible with life, and such as the powers of life cannot repair. But if the ab-

straction, even of this minute quantity of blood, at this point of the inflammatory process, do not put a stop to that process, the remedy will co-operate with the disease, to depress the powers of life, and will deprive the patient of what chance of recovery he might otherwise have had. To decide in a case which requires such nice discernment, and in which, even with the best discernment that can be exercised, the event must always be so doubtful, is a task which few physicians, who understand the nature of it, find either easy or agreeable.

But instead of bleeding, the proper remedy may possibly be the very reverse: it may be requisite to afford a stimulus. The change of structure produced by the inflammatory process may not have proceeded to such an extent as to be absolutely incompatible with life; but the powers of life may be so exhausted by the inflammatory excitement that, unless aid be brought to them, they will be overpowered, and sink: afford them appropriate aid, and they will rally, and, although slowly, ultimately repair the lesion which the organs have sustained.

This is precisely the condition, and perhaps it is the only condition, under which stimuli are rarely beneficial in fever. Whenever such remedies are indicated, the vascular action is weak, and there appears to be a want of due supply of arterial blood to the brain. Of all stimuli, wine or brandy is the best. If it be doubtful whether a stimulus

can be borne, or will prove beneficial, a few ounces of wine may be administered. It will soon be manifest whether it be the appropriate remedy. If the restlessness, the heat, the delirium increase under its use, it will be obvious that it cannot be borne; if, after some hours, no perceptible impression be made upon any symptom, it is seldom of the least service, given to any extent, or persevered in for any length of time. If it be capable of doing any good, some improvement in the symptoms is commonly perceptible in a few hours after it is first administered. Sometimes that improvement is sudden and most striking; more commonly it is slight, slow, but still easy to be seen. If the pulse become firmer, and especially slower, the tremor slighter, the delirium milder, the sleep sounder, the skin cooler, and, above all, if the sensibility increase, and the strength improve, it is then the anchor of hope. It will save the patient if it be not pushed too far, and if it be withdrawn as soon as excitement is reproduced, should that happen, which it often does.

No certain indication for the administration of wine can be drawn from one or two symptoms alone: neither from the state of the pulse, nor of the skin, nor of the tongue; neither from the tremor, nor from the delirium. There is an aspect about the patient, an expression not in his countenance only, but in his attitude, in the manner in which he lies and moves, being, in fact, the general result, as well as

the outward expression of the collective internal diseased states, that tell to the experienced eye when it is probable that a stimulus will be useful. Depression, loss of energy in the vascular system, as well as in the nervous and the sensorial, indicated by a feeble, quick, and easily compressed pulse, no less than by general prostration, afford the most certain indications that the exhibition of wine will be advantageous: and if the skin be at the same time cool and perspiring, the tongue tremulous, moist, or not very dry, and the delirium consist of low muttering incoherence, these symptoms will afford so many additional reasons to hope that it will prove useful. On the contrary, if the skin be hot, the eye fierce or wild, the delirium loud, noisy, requiring restraint, and the general motions violent, it is as absurd to give wine, as to pour oil upon a half-extinguished fire, with the view of putting out the yet burning embers.

When wine is indicated, but does not produce a decided effect, brandy may be substituted. I have seen no benefit arise from giving either in large quantity. When the condition is really present in which alone it can be useful, a moderate quantity will accomplish the only purpose it can serve. In every other condition, wine may be administered to any extent, (and I have given half a pint every hour) until the stomach return it, by vomiting, without the slightest impression being made upon the disease, or any, or

scarcely any, upon the system. The malady is in possession of the seat of sensibility; it has destroyed the organ; it has abolished the function: what advantage can result from the application of stimuli? The spirit that could feel their impression, and answer to it, is gone: organs destroyed by over-stimulation, cannot be regenerated by the application of additional stimuli: the apparatus is broken; the wheels are clogged; the obstruction lies in that part of the mechanism in which the main power that works the machinery is generated; that obstruction cannot be removed; the movements of the machine must cease. Even when the case is not thus utterly hopeless, wretched is the physician whose only dependence for the safety of his patient is in wine.

These considerations ought not to make us desponding, or inert, even under the worst circumstances, as long as the case is not absolutely desperate; but they ought to impress deeply and indelibly upon the mind of the practitioner who has the first charge of a fever-patient, that the disease must be conquered in the very first days, or it will conquer, and that there are no means by which that conquest can be rendered sure or probable, but that afforded by the lancet.

Very much the same observations apply to the exhibition of opiates. There is a condition of the system in which an opiate puts a stop to a state of

exhausting agitation and restlessness; procures tranquil sleep; lessens delirium, and operates most favourably on all the symptoms. This may be when the skin is cool and perspiring; the tongue moist, or not very dry; the delirium low, and the pulse and the patient weak. No kind of opiate in any form in which it can be administered ever proves in the least degree beneficial whenever the skin is very hot, the tongue very dry, or the general motions and actions of the patient are violent.

Now and then the powers of life rally unexpectedly and wonderfully: they throw off a load which appeared to have oppressed them totally and for ever. It is therefore the duty of the medical attendant to be always at hand until the termination even of the most desperate case, and carefully to watch every change that takes place; for changes may suddenly occur which may give him a clue to bring in invaluable assistance. He may be suddenly called upon to give a stimulus; he may be suddenly called upon to check re-excited and inordinate action. To describe in words the countless variety of circumstances under which it may be necessary that he should take very unexpected and decided measures, and not a few of which may demand of him clear discernment and nice discrimination, is quite impossible: he can acquire the power of performing the most difficult and arduous duty he has undertaken only by studying the disease, and by rendering him-

self perfectly familiar with the principle of its treatment.

When the inflammatory action has proceeded unsubdued and has terminated in some change of structure, probably accompanied with copious effusion, as indicated by the symptoms detailed under the cases illustrating cerebral affection, advantage is sometimes obtained by affecting the system with mercury. In this condition of the brain it is not easy to bring the system under the influence of mercury; when it can be accomplished, the patient is commonly, though not invariably, snatched from death. In several instances I have known this treatment successful under apparently the most hopeless circumstances. When the success is most complete, the convalescence is invariably tardy, and often appears to be doubtful; the mind for a long time remains feeble, infirm, and almost fatuous; and, as in the two cases recorded by Pringle, though such patients recover of their fever, it is long before the nervous and the sensorial systems are restored to a sound state. The best mode of exhibiting mercury is in the form of a pill, consisting of two grains of calomel with half a grain of opium, given every three, four, or six hours.

3. To a fever which is severe from the commencement the preceding observations apply with double force. Then, if the most powerful remedies are not immediately employed, and if they are not brought to

bear at once upon the severe symptoms in the completest combination, the case is wholly lost. The delay of an hour is pregnant with danger; the delay of a few hours places the efficacy of any measures that can be taken in great uncertainty; and the delay of a day or two renders their most vigorous application utterly useless. Whereas, knowing, as we now know, the condition of the organs upon which the severity of every case depends, and knowing remedies appropriate to that condition of sovereign efficacy, exceedingly few of such cases would be lost were these remedies employed with due vigour at the commencement of the attack. The typhoid symptoms with which it is commonly thought such cases commence would never appear. The patient would be convalescent, or at least would labour only under a mild form of fever at the period when, without these remedies, his condition would be hopeless. The practitioner ought never for a moment to forget that it is in the power of early and active treatment to deprive these severe cases of all their severity and, consequently, of all their danger; but that, after the lapse of a day or two, all human skill will be exerted in vain.

It remains to say a word or two relative to the modification of the more powerful remedies, as the prominent affection may have its seat in the brain, the lungs, or the intestines.

I. Of the Modification of the Treatment in Cerebral Affection.

The treatment in a cerebral case of moderate severity has been already sufficiently explained. Blood must be drawn to the subdual of the inflammation, and if blood be abstracted early, two, or at most three, moderate bleedings will be all that will be required.

But when the attack commences with severe cerebral affection, the bleeding must be proportionally large, and early as it is copious. A bleeding adequate to subdue a moderate, will be utterly inert in a severe degree of cerebral disease. I give, as a specimen of what may be sometimes required, the case of Dr. Dill. I saw my friend at the very commencement of his attack, and was, therefore, able to carry into effect what I conceive to be the proper treatment with due promptitude and vigour. I saw him before there was any pain in the head, or even in the back, while he was yet only feeble and chilly. The aspect of his countenance, the state of his pulse, and the answers he returned to two or three questions, satisfied me of the inordinate, I may say the ferocious, attack that was at hand. Having taken an emetic without delay, as soon as its operation was over, blood was taken from

the arm to the extent of twenty ounces. During the night, severe pain in the limbs, especially in the loins, and intense pain in the head came on. The blood that was taken on the preceding evening was not inflamed. Early in the morning he was again bled to the extent of about sixteen ounces, with great diminution, but not entire removal of the pain: the pain not lessening, towards the afternoon he was again bled to the same extent: the pain was now quite gone; the blood from both these bleedings was intensely inflamed. During the night the pain returned, and, in the morning, the eyes were dull and beginning to be suffused, while the pulse continued slow and intermittent, and the respiration suspirious; but the face was blanched, and the pulse, in addition to its other characters, was weak. Instead of opening the vein afresh, twelve leeches were applied to the temples; these very much relieved, but still did not entirely remove the pain; for this reason, he was cupped to the extent of sixteeen ounces: this operation afforded very great relief, and he continued easy until the following evening, when the pain returned, and he was again cupped on the temples to the same extent. Immediate relief followed this second operation; but, unfortunately, the pain returned with great violence towards evening, and it was now impossible to carry the bleeding any farther. Within twenty-four hours, it was plain that typhoid symptoms in abundance would

be present, for the fur on the tongue was becoming brown, and there was already slight tremor in the hands. No more blood could be taken with any prospect of advantage, nor even with safety; yet, without the aid of some powerful remedy the case was lost.

The whole scalp was now enveloped in ice, but so intense was the heat of the head that it was melted in a few minutes, and the clothes, steeped in the evaporating lotion, dried with extraordinary rapidity. Neither of these expedients produced the least perceptible effect.

What was to be done? Recourse was had to a measure the efficacy of which is but little known and less appreciated; a remedy the power of which is second only, if, under some circumstances, it be not even superior, to that of the lancet; a remedy which can never supersede the lancet nor dispense with it, but which, when added to it, forms by the combination a treatment so powerful and efficacious that it might render death, from the acutest cerebral inflammation, as rare as recovery is at present.

This remedy is known by the name of the cold dash. It consists of pouring a column of cold water upon the head in a continued stream from a height of from six to ten feet. The mode of applying it is as follows. The patient is seated in a large tub; a table is placed at the side of the tub upon which a man stands, and at as great an elevation as his arms can

reach, pours upon the naked head of the patient a steady but continued stream of cold or iced water, from a watering-pot without the rose. The stream is made to fall as nearly as possible upon one and the same spot. At first the elevation must be slight, for the shock is too violent if the stream be poured at once from the highest point. There is a record, that in the East, where ingenuity so long laboured for tyrany to invent the most exquisite modes of torment, the victim was placed with his bare head under a small stream of cold water which was so directed as to fall unceasingly upon one spot. In this instance cruelty was cheated of its object by its ignorance of the mode in which its expedient operated. The device was well adapted to kill but not to produce pain, for insensibility must soon have put an end to suffering.

Employed as a remedy, there is no degree of burning heat which the animal economy is capable of producing, no intensity of vascular action, and no violence of pain that can resist its continued application. Sooner or later, usually in from ten to twenty minutes, the heat, though most intense, disappears, the skin becomes cold, the face pallid, the features shrunk, while the pulse is reduced to a mere thread, and the pain of the head, however violent and intolerable, entirely ceases. After the patient has been wiped dry, which he should be as rapidly as possible, and placed in bed, the symptoms may soon return

in all their violence; the same process will again remove them, and as often as the former recur the latter must be repeated. Three or four repetitions will commonly suffice to subdue the most intense cerebral affection. In the case of Dr. Dill, the relief it brought was instantaneous and most complete. From a state of intense suffering it rendered him perfectly easy, and from a state of imminent danger, safe. I had no anxiety about him from the moment he came out of his tub, although it was necessary to pass him through the same ordeal three times; but he himself having tried this remedy on his sister, having in her case witnessed its efficacy, and now felt it in his own, was extremely desirous that it should be repeated as soon as he was conscious of any return of pain. In consequence of its application, together with the copious depletion that preceded it, at the period when under ordinary treatment, the most exquisite typhoid symptoms would have been present, he was convalescent.* If we consider how powerful the abstraction of caloric

* Watchful of the convalescence as experience had taught us it is necessary to be after so severe an attack, still he was allowed to put himself too forward. When to all appearance recovered, though still weak, he undertook a journey of fifty miles, that he might the more completely re-establish his health in the country. He had not arrived at his journey's end an hour before he relapsed. He was again bled, and the cold dash was applied a second time with success. From the commencement to the termination of the disease, 120 ounces of blood were abstracted in this case.

must be by every fresh current of water that falls upon the head, to what a mere thread the minute external blood-vessels must be constringed, and consequently to what an extent the internal must be affected, we shall not wonder at its efficacy. Powerful as the cold affusion is when exhibited in its ordinary mode, yet the impression it makes upon the brain, compared with the effect produced by this remedy, may be said to be what the application of six leeches to the temples is to the abstraction of thirty ounces of blood.

Cold applications to the head, and evaporating or iced lotions, are useful in mild cases; they may keep up the effect produced by this in the more severe, but to hope to control the latter by their aid alone, is to expect to coerce a giant, by twisting around his arms a spider's thread.

II. Of the Modification of Treatment in Thoracic Affection.

Fortunately, there is a remedy nearly as powerful and efficacious in intense thoracic affection, as blood-letting and the cold dash are in the cerebral. In the severe bronchial affection of fever, blood-letting is of little avail. It seems to have scarcely any control over the peculiar affection of the lining membrane of the bronchial tubes, or even over the

inflammation of the substance of the lung, which so often accompanies the intense form of thoracic disease. It weakens the patient, without making a decided impression upon the disease. Laennec states that the pathology of pneumonia could scarcely be learnt under his practice; for that he treated the disease, not by blood-letting, but by tartar emetic; and that all his patients recovered. I thought this one of the exaggerated statements in which medical writers sometimes delight to indulge; but it immediately occurred to me that this remedy might prove exceedingly efficacious in the bronchitis of fever. Its efficacy has surpassed my expectation. It seldom fails if exhibited with promptitude and decision. The mode in which it is most efficiently administered, is in doses of two grains, dissolved in an ounce of water, and repeated every second, third, fourth, or sixth hour, according to the severity of the case.

In the slight bronchial affection, which is so constantly present in fever, nothing is required but the mucilage of gum-arabic, or a little of the almond emulsion now and then, with the tincture of hyosciamus, or two or three grains of the compound powder of ipecacuanha, to allay the irritation of the cough. The inflammation of the mucous membrane, when slight, spontaneously subsides.

III. Of the Modification of the Treatment in Abdominal affection.

No remedy at all comparable in efficacy to the preceding has yet been discovered for the inflammation of the mucous membrane of the intestines, which forms so constant and formidable a part of the organic affection of fever. General bleeding has but little influence over the disease. If employed early and with due activity, it will prevent the affection from occurring, but, when once it has supervened, large bleedings are out of the question, and even small and repeated bleedings are not as effectual as leeches. In severe cases, the abdomen should be covered with leeches, and they should be re-applied daily, until the pain and tenderness are gone, or, at least, have become slight, for it is often impossible entirely to remove the tenderness. The abdomen should be covered with a poultice as soon as the leeches fall off. Afterwards, the application of a linen rag, moistened constantly with the oleum terebinthinæ, keeps up the effect produced by the leeches, and, when the affection is slight, may supersede their use altogether.

When the purging is considerable, five grains of the hydrargyrum cum cretâ, with five of the pulvis ipecacuanhæ compositus, given every night or every

night and morning, often checks it; if this remedy fail, a stronger opiate may be exhibited, and sometimes an anodyne enema may be administered with great advantage. If there be constipation, one or two drachms of castor oil is the proper laxative. Active or irritating purgatives are highly injurious.

When blood is mixed with the stools or there is considerable hæmorrhage from the intestines, every thing that can irritate the mucous membrane must be carefully avoided. The mineral acids sometimes appear to check the discharge. The infusion of roses rendered stronger by the addition of a few drops of the sulphuric acid, is a convenient mode of administering such medicines, and the efficacy of the draught is sometimes improved by the addition of a drachm of the tincture of hyosciamus. It is not uncommon for copious discharges of blood to alternate with constipation. In this case the mildest laxative must be administered with caution. The powers of life are sometimes so prostrate, that three or four stools, excited by purgative medicines, are sufficient to exhaust them. A tea-spoonful of castor oil, repeated at intervals of six hours, is all that should be attempted. Now and then a stimulant has a greater effect in checking the hæmorrhage than an astringent, and then the oleum terebinthinæ is the best remedy.

IV. We have spoken of a fever still more intense

even than this, severe as it is, under the name of the intensest form of fever. And of this, the same may be said as was stated of the mildest, that there is little or nothing to be done. As far as regards the treatment, the two extremes of fever, the mildest and the most intense, meet, for in the first no remedies are required, and in the second, none are of any avail. In these latter cases, there is no remedy and no combination of remedies yet known, capable of affording effectual aid. The abstraction of the smallest quantity of blood is fatal: the application of the cold bath is out of the question; the warm bath is inert; the vapour-bath affords rather more prospect of benefit; but the proper remedies, if any exist, remain to be discovered.

When a person has swallowed a certain quantity of laudanum, there are remedies which are capable of counteracting the poison and of saving the patient. When he has swallowed a larger dose, provided it amount to a certain quantity, no remedies will avail, excepting the application of the stomach-pump. Unless the poison be promptly expelled from the system, adopt with the utmost vigour the best-concerted expedients which the medical art can supply, the patient will die. A person afflicted with the intensest form of fever, is in the condition of a person who has swallowed this large dose of poison. When a pump is invented, capable of extracting *his* poison from the brain, he may be saved.

V. Of the Treatment of Scarlet Fever.

Little modification is required in the treatment of scarlet fever. The most important difference between continued fever without and with an eruption, is the greater predominance of nervous affection in the former and of inflammatory affection in the latter. Accordingly, in scarlatina there is not only a greater tendency to inflammation than in ordinary fever, but the inflammation which is set up in the febrile circle of organs approximates more to the character of pure inflammation. There is greater vascular action, with less nervous and sensorial depression. The consequence is, that blood-letting may be carried to a greater extent, and will be attended with still more decided and more certain efficacy than in ordinary fever. After a decided impression has been made upon the vascular excitement by general bleeding, the application of ten or twelve leeches to the throat is of sovereign efficacy. If scarlatina be treated in this manner on the second day, or sometimes even on the third, though it commence with exceedingly severe symptoms, yet the patient will be convalescent in the course of three or four days.

It is not probable that much advantage would be derived from the detail of numerous cases to illustrate

the modification of treatment, and the circumstances under which particular remedies should be chosen. A few are subjoined for specimens of the ordinary extent to which bleeding may be carried, and of the usual conditions under which wine may be exhibited, and of the results, when favourable, produced by each remedy.

Case CXI.

Mary Ann Hunt, æt. 24, servant. Admitted on the 14th day of fever: attack commenced with shivering, succeeded by heat, nausea, and head-ache; until last night, has had no stool for five days. At present, no pain of head or chest; much pain of limbs; sleeps well; severe pain over the epigastrium, increased considerably by coughing and by pressure; tongue thickly coated with a whitish-yellow fur, through which the papillæ appear large and prominent; much thirst; no appetite; no stool to-day; skin warm; catamenia regular; pulse 135, of good strength.

V.S. ad ℥xxvj. Haust. Sennæ Sal. quam primum. Acid. Mist. pro potu. Mist. Acet. Amm. C. 6ta q. h.

15th. Pain of limbs quite gone; that of epigastrium also entirely removed; no tenderness on the fullest pressure; tongue more clean; less thirst; several stools; slept well; skin cool; pulse 84, soft. Blood in both basons very buffy. Cont. med.

16th. Continues quite free from pain; tongue

nearly clean; two stools; skin cool, moist; pulse 88. Pt. med.

18th. No return of pain; tongue clean; pulse 87; four stools; skin natural. Pt. med.

22d. Sat up yesterday and the day before, since which the skin has become more warm, the pulse more quick, and the tongue more loaded, but there is no local pain, and the bowels are open.

23d. Pains of limbs returned; slept ill; tongue loaded at root; pulse 110.

24th. Pains diminished; pulse 100; tongue still furred; skin warm.

26th. Pains gone; skin cool and moist; tongue the same; two stools; pulse 100.

28th. Tongue more clean; skin warm; pulse 76.

35th. Convalescent. Inf. Casc. c. Senna bis.

41st. Dismissed cured.

Case CXII.

Eleanor Welby, æt. 21, servant. Attacked four days ago with chilliness, shivering and pain of head. At present, pain of head gone; mind distinct; little or no sleep; eyes suffused and injected; no uneasiness of chest nor cough; throat sore, with difficult deglutition; tenderness of abdomen on pressure; tongue loaded on body with white fur, extremely red at edges and tip; lips and teeth sordid; some thirst; bowels regular; pulse 129, of good strength,

yet easily compressed; efflorescence of skin of dark red colour, approaching to a dusky hue. V.S. ad xvj. Hirud. viij. gutturi. Ol. Ricini, ʒiij. quam primum. Mist. Acid. pro potu.

6th. No uneasiness of head; slept ill; eyes suffused and injected; face swollen; still complains of soreness of throat, which is undiminished; tongue moist; teeth sordid; lips sordid and cracked; less thirst; three stools; pulse 120, firm; blood very sizy and cupped. Rep. V.S. ad ℥xiij. et Hirudines viij. gutturi. Pt. Med.

7th. Expression of countenance more natural; face less swollen; more sleep; throat greatly relieved; deglutition quite easy; no tenderness of abdomen on full pressure; tongue more clean and moist; lips and teeth less sordid; pulse 111; eruption less distinct. Haustus Sennæ Sal. c. m.

8th. No uneasiness of head, throat, or abdomen; sleep natural; tongue beginning to clean, much less red; pulse 114; skin exfoliating.

9th. Convalescent.

14th. Has been gradually gaining strength and is now quite well. Dismissed cured.

Case CXIII.

Mary Jones, æt. 33, married. Three days ago attacked with shivering, succeeded by glows of heat, severe pain in the back and lower extremities, with

much head-ache. At present, pain of head severe, especially over the forehead; mind distinct; scarcely any sleep; no uneasiness of chest; some cough; abdomen tender on pressure; tongue not much loaded; some thirst; no appetite; one stool; pulse 108, of some power.—V.S. ad ℥xvj. Ol. Ricini, ʒiij. q. p. Mist. Acid. pro potu.

Hora 3tia, P. M. Pain of head diminished since the bleeding, but by no means removed; much pain of back; some of abdomen; pulse 112, strong, full, sharp, and not easily compressed. Blood with firm and thick buff. Rep. V.S. ad ℥xvj. statim. Pulv. Aper. Mit. h. s.

4th. After the second bleeding last night, the pain was entirely removed: she slept well, and the pain continued absent until this morning, when it returned with great severity, or rather violence. She was bled to the extent of fourteen ounces with immediate and great relief: blood in both cups with firm buff and proportion of crassamentum large: at present, the head is quite free from pain; there is scarcely any pain in the back; no tenderness of the abdomen; tongue loaded in middle with white fur, moist at edges, of natural colour; four stools; pulse 120, weak.—Pt. Med.

5th. No return of pain in the head; that of back continues; slept ill; tongue much more clean and quite moist; four stools; pulse 120, weak; skin warm and damp. Omit. pulv. Pt. alia med.

6th. Pain of head returned with great severity last night, for which she was bled to the extent of four ounces with only temporary relief; no sleep on account of the severity of the pain; skin hot; entire scalp extremely hot; face pallid; nothing unnatural in the appearance of the eye, and no intolerance of light; pulse 120, sharp, but easily compressed; tongue loaded with white fur; thirst; four stools; buff on blood pretty firm.

C. C. ad ℥x. nuchæ. Camphoræ, gr. v. c. Extract. Hyosci. gr. iij. 6ta. q. h. Pulv. Aper. Mit. h. s. Lotio frigida capita raso.

7th. Pain of the head entirely removed since the cupping, and has not since returned; slept well; face continues very pallid; tongue loaded with white fur in middle; very pallid; pulse 120, of good strength; feels quite easy, but very weak. Cont. Pilulæ. Capt. Haust. Quininæ Sulph. 6ta. q. h.

8th. No return of pain in the head; some in loins; scarcely any sleep; tongue the same; four stools; pulse small and extremely weak. Pt. Med. omnia. Capt. Vini Albi, ℥iv. in dies.

9th. Free from pain in the head, back, and every organ; scarcely any sleep; much restlessness; delirium; countenance pallid and sunk; feels very weak; tongue the same; four stools; pulse 120, not so weak as yesterday. Pt. Med. Vini Albi ad viij.

10th. Slept ill; much restlessness and delirium;

frequent and deep sighing; severe pain in the lower extremities recurring in paroxysms; she says the pain is as if some one were rending her limbs from her; tongue white, moist; four stools; pulse 110, weak; takes and relishes her wine. Statim capiat Haustus Anodynus, c. Liq. Opii Sedativi, gtts. xl. Augt. Vini Albi, ad ℥x. Cont. alia med.

11th. Long and tranquil sleep after the draught; less delirium; no sighing; no return of pains in the limbs; mind perfectly distinct; "feels greatly better;" countenance much more animated; tongue the same; pulse 108, more strong and firm, but still easily compressed. Cont. Med. Rept. Haustus Anodynus hora decubitus.

12th. Slept well all night; "feels very much better to-day;" no return of pain; complains only of sense of lowness; pulse 96, weak. Pt. Med. omnia.

13th. Continues to improve in all respects.

14th. Feels stronger; pulse 108, of good strength; occasional muscular tremor. Pt.

18th. Continues steadily to improve. Pt. Jus. Bov. lbj. in dies. Vini Albi, ℥vj.

23d. Convalescent. Omit. Med. Inf. Cascaril. c. Senna, bis.

33d. Free from complaint. Dismissed cured.

In this case bleeding was carried to the utmost extent to which it could be carried with safety, and rather beyond it; but it was one of those cases in

which less was to be apprehended from the bleeding than from the disease.

Case CXIV.

Frances Jacob, æt. 17, destitute. Four days ago seized with nausea, vomiting, head-ache, and other febrile symptoms. At present, much pain of epigastrium, which is extremely tender on pressure; throat sore; deglutition very painful; much vertigo; scarcely any head-ache; no sleep; mind confused through the night; some pain of chest on full inspiration; cough, with viscid copious sputa; very considerable dyspnœa; aspect of countenance leaden-coloured and oppressed; skin warm, of a dusky, unhealthy red colour; tongue very red, not much loaded; bowels constipated; pulse 135, tremulous and indistinct. Abradat. Capillitium. Hirud. viij. faucibus externis. Postea Empl. Emoll. Empl. Lyttæ nuchæ. Inhal. Vap. Aq. Calid. Garg. c. Borat Sodæ. Ol. Ricini ʒiij. q. p. Pulv. Aper. Mit. h. s.

5th. No pain of head; no sleep; mind confused; much low talkative delirium; still uneasiness of chest on full inspiration; throat less painful; deglutition more easy; dyspnœa and cough the same; abdomen tender; tongue unchanged; four stools; pulse 120, feeble and indistinct; skin covered universally with very unhealthy red, dusky efflorescence.

Pulv. Aper. Mit. h. s. Mist. Camphor, ℥iss. c. Tt. Hyosciami, ʒj. et Ammon. Carbon. gr. x. 4ta. q. h. Vini Albi, ℥vi. in dies.

6th. Much delirium; some sleep; skin of same colour; rather more sensible to day; says she has no pain of head, but sense of severe soreness all over her; much cough; four stools; pulse 120, weak. Pt. Med. et Vin.

7th. Slept well; less delirium; "feels much better;" countenance greatly improved; skin more warm; colour much more natural; throat still painful; deglutition difficult; some tenderness of the epigastrium on full pressure; scarcely any over the abdomen; tongue red at edges, brown and dry in middle; much thirst; three stools; pulse 108, soft, not very weak; lips and mouth surrounded with an herpetic eruption; skin not abraded, but covered with soft scab. Pt. Med. omnia.

8th. Slept well; asleep at present; no delirium; pulse 108, soft.

9th. Still more improved; pulse 96, soft.

13th. Pulse 87; other symptoms the same. Pt.

14th. Complains more of pain of epigastrium, which is considerably tender on pressure; other symptoms the same. Catap. Sinap. epigast. Pt. alia.

15th. Epigastrium much relieved; other symptoms the same. Pt.

18th. Convalescent.

24th. Dismissed cured.

Case CXV.

Margaret Skey, æt. 37, married. Five days ago attacked with sense of cold, shivering, and heat, together with pains in the bones. At present complains of pain in small of back; no head-ache; no pain of chest; some cough; no tenderness of abdomen; tongue white and dry; much thirst; bowels constipated; sleeps tolerably; pulse 112. Haust. Sennæ Sal. q. p. et c. m. Rep. Mist. Acid. pro potu.

6th. Abdomen very tender; tongue red; four stools; much thirst; skin warm; face flushed; pulse 100, easily compressed. Hirud. x. abdom. Postea Catap. Emoll. Rep. alia.

8th. Much delirium through the night; considerable muscular tremor; pain of abdomen gone; tongue tremulous, but not much coated; much thirst; four stools; pulse 100, weak; frequent shivering. ℞. Quininæ Sulph. gr. ij. Aq. Rosæ, ℥j. M. Sit Haustus, 6tis. q. h. sumendus. Jus. Bov. lbj. in dies. Rep. alia.

10th. No sleep; mind confused; two stools passed in bed; urine in bed; respiration laborious; pulse 90, weak. Alcohol (brandy) ℥iv. ex Aqua per diem. Pt. Med.

13th. Slept better; less delirium; two stools not passed in bed; pulse 96.

15th. More power; stools not passed in bed; other symptoms the same. Pt.

17th. Strength again rather diminished; tongue rather brown; much thirst; pulse 100; no pain. Pt.

21st. Little change, excepting that the tongue is more brown, dry, and tremulous; pulse 108, extremely feeble; mind distinct; no delirium; two stools. Aug. Alcohol ad ℥vj.

22d. Tongue less brown and more moist; pulse 108, stronger; slept well. Pt.

24th. Countenance much more animated; tongue more clean, quite mosit, still brown towards root; pulse 110. Pt.

25th. Countenance still more improved; tongue more clean; no longer brown; pulse 102, weak.

26th. Much improved; tongue nearly clean; two stools; pulse 108, weak.

27th. Gains strength. Alcohol ad ℥iij.

34th. Convalescent, but still very weak. Cerevis. lbj. Pt. alia.

45th. Has been gradually, though very slowly gaining strength; tongue now clean; appetite good; bowels regular (Low Diet); 2 ozs. meat daily.

52d. Dismissed cured.

II. Treatment during the Convalescence.

The management of the convalescence is one of the most difficult parts of the treatment and one of the most unsuccessful, not because there is any thing which requires to be done, nor because there is any disease which prevents recovery, but because the patient is considered as well when he is only convalescent. Of the great tendency there is to relapse during the whole of this period few medical men are sufficiently aware, and the unprofessional attendants on the sick are totally ignorant of it. For a long time the brain, the bronchi, and the intestines remain so irritable that the slightest excitement is capable of renewing the diseased action which has recently subsided; but without excitement of some kind, that renewal never takes place. It is the duty of the physician and the nurse to guard the patient from such excitement, which they may always do completely; so that whenever there is a relapse, the physician, or the nurse, or both must be in fault: as long as they perform their duty with judgment and firmness there is no such thing; but this part of their duty which is extremely simple, they cannot be induced to believe to be of importance: no one who has not seen death happen over and over again from the neglect of it will believe it, and even those

upon whom melancholy experience has impressed the truth most strongly, constantly allow themselves to be surprised at the slightness of the excitement by which, and the advanced period of the convalescence at which relapse may happen. It is not easy for a nurse to resist incessant importunity and even reproach; and there are suspicions to which a physician is subjected, which, when he sees that they are entertained, it requires some moral courage to enable him to bear. Without doubt he deserves the worst that can attach to him if he allow the caprice, or the impatience, or the injustice of his patient, or any earthly consideration to induce him to swerve from the faithful discharge of the duty he has undertaken. The unreasonableness of the convalescent, should be considered and treated as the delirium of the preceding stage.

The mismanagement of the convalescence consists chiefly in allowing the patient to rise too early from bed, and to take solid food too soon and in too large a quantity; and these are by far the most frequent causes of relapse. Were I to place on record all the instances I have seen of fatal relapse from these two causes alone, the list would be frightful. Many patients, the very day they become convalescent, think they ought to be allowed to get up. They feel well, they think they are so; they earnestly declare that they are so. They are impatient of bed; they imagine it keeps them weak: "if you

would but allow me to rise how thankful I should be; how much more it would refresh and strengthen me than any thing that can now be done." Such is the language which is constantly addressed to the physician in the early period of convalescence, and if he be weak enough to yield to it and allow his patient to rise, it is a chance if he ever rise again. The most cautious and experienced physician sometimes finds himself deceived, falling into the same error with his patient, and thinking him stronger than he is. Whenever this happens, the physician has great reason for self-reproach, *because he ought to allow no risk to be run.* Often, however, in private practice, the physician is allowed to have no control whatever over the management of the convalescence —he is dismissed as soon as the patient is out of apparent and urgent danger; dismissed hastily, often to be more hastily recalled to witness the death of him whom every one thought to be well.

But if merely rising from bed at too early a period occasion the death of great numbers, eating heartily of solid food is a still more frequent and certain cause of it. The appetite is generally keen immediately after fever has subsided: if animal food be allowed as soon as the appetite craves for it relapse is sure to be produced. Often and often have I seen fatal cerebral and abdominal inflammation excited in a few hours after the commission of this error. I do not expect, by any language at my

command, to communicate to others my own conviction of its danger. I know that such a conviction can be produced in no one who has not an opportunity of observing the convalescence of large numbers; and I know that no one who has such an opportunity can be without it.

There are three conditions under which this danger is peculiarly imminent. First, when the disease has been unusually severe and protracted. The more intense the fever and the longer it has lasted, the more are all the organs enfeebled, and the longer do they retain the irritability of weakness. In this state, any thing beyond the gentlest stimulus will induce vascular excitement, which will rapidly pass into inflammation.

Secondly, when the disease was severe in the commencement, and has been promptly subdued by active treatment. Whenever copious bleeding brings on a precocious convalescence, that convalescence is invariably uncertain and infirm. It is always steady as long as it is properly protected, but it has not strength equal to its apparent health: it is as tender and fragile as it is sensitive: the least noxious agent impresses it; the least stimulus overpowers it. The patient is suddenly relieved from a load that oppressed him; the organs react with preternatural vigour; they have enough to do to sustain the reaction of the system: stimulate them still further by animal food and wine, and they will be sure to be

over done; and this artificial excitement will be as fatal as the excitement of disease. It can be of little consequence to the patient whether he die of malaria or of chicken.

Thirdly, when the disease was slight in the commencement and through its subsequent progress, but the convalescence proved tardy and imperfect. In this case, animal food and wine are pernicious and highly dangerous, and often prove more fatal than a severe form of fever. Nothing is advantageous or safe for such a patient but perfect rest and quiet and the blandest farinaceous diet.

I have now laid before the reader all that I have been able to learn of this frequent and most formidable disease. I am conscious that some of the views which have been exhibited are opposed to the prevalent doctrines of the day, and that some parts of the treatment recommended must appear to many unnecessary and hazardous. But since I have suggested no doctrine which has not been deduced from a long and careful study of the phenomena, and recommended no practice which has not been derived from large experience, I trust that the former will not be rejected without examination, nor the latter condemned until its failure have been witnessed. I have opposed with earnestness, perhaps some may think with vehemence, certain opinions and modes of practice which I conceive to be pregnant with evil; but as I have never intended the slightest re-

proach or blame to the advocates of the doctrines I condemn, so I shall feel truly grateful to any one who will point out any mistake into which I may have fallen. Those who have studied this disease with the best success are the most sensible how much remains to be done to render our knowledge of it perfect and our treatment of it effectual. Many are the dark spots that still remain upon this part of the field of knowledge; many are the labourers that must work long and skilfully before they are removed; while, if the successful investigation of medical science in general contribute largely to the well-being of man, the successful study of this branch of it must be pre-eminently beneficial. It is computed that upwards of one-half of the human race perish by this fell disease in one or other of its forms: when this fact is coupled with the truth disclosed by the annexed tables, which show at what age this malady is most prevalent and fatal, we become duly impressed with the importance of labouring to render our knowledge of this dreadful disease complete, that we may lessen, as far as possible, the suffering of our common nature, and extend to its utmost limit the term of human life, too brief when most protracted, but constantly cut short by this great enemy of our race, just as adolescence is ripening into manhood.

APPENDIX.

The annexed Tables furnish, in general, their own commentary. The facts established by some of them are curious and important. I lay them before the reader without observation, at present; but I shall have occasion to return to them hereafter.

Metereological Table, with reference to Admissions and Deaths, for 1825.

Weeks.	Admissions.	Deaths.	Heat.		Moisture.		Wind.		Weather.	
			Max.	Min.	Max.	Min.				
1	6	0	54	32½	964	685	West.	North.	Fine.	
2	9	2	46	34	966	755	North.	East.	Hazy.	
3	16	1	46	34	1000	763	West.	North.	Cloudy.	
4	13	4	50½	32	984	711	North.	North-West.	Cloudy.	Hazy.
5	7	1	51	30	839	614	West.	West by North.	Fine.	
6	10	2	48	33	971	783	South-West.	WbN.	Fine.	Hazy.
7	9	1	51	38	870	820	East.	West.	Cloudy.	Rain.
8	8	3	47	36	962	659	East.	North.	Cloudy.	
9	4	0	46	36	932	538	West.	North-West.	Fine.	Cloudy.
10	8	2	52	34	966	658	West.	North.	Dark. C.	Hazy.
11	2	0	48	31	862	452	North.	East.	Cloudy.	Fine.
12	5	3	52	39	1000	598	East.	South-East.	C. H.	Dark.
13	12	1	61	42	807	347	East.	North.	Fine.	Hazy.
14	10	2	62	41½	904	522	East.	North-West.	Fine.	Cloudy.
15	19	3	63	46	844	470	North.	West.	Fine.	Cloudy.
16	7	2	63	53	901	553	West.	East.	Cloudy.	D. F.
17	12	1	71	54	801	538	South.	East.	Rain.	Cloudy.
18	4	1	67	52	907	516	South-West.	North.	Cloudy.	Rain.
19	10	1	63	53	712	516	North.	East.	Cloudy.	Fine.
20	11	2	74	53	765	442	East.	West. North.	Cloudy.	Fine.
21	6	3	66	54	905	466	West.	West.	Cloudy.	Rain.
22	6	3	81	63	748	449	South.	North. West.	Fine.	Cloudy.
23	5	1	80	59	774	404	North.	East.	Fine.	Cloudy.
24	18	2	71	57	721	421	North-West.	South.	Cloudy.	Fine.
25	11	2	72	58	800	472	North-West.	East.	Cloudy.	Hazy.
26	8	0	84	57	937	439	West.	South-West.	Fine.	
27	10	2	87	75	727	437	East.	South-East.	Fine.	
28	13	1	78	63	850	429	East.	North.	Fine.	Cloudy.
29	9	2	86	65	660	357	West.	South-West.	Cloudy.	Rain.
30	15	2	70	65	793	488	West.	North-West.	Cloudy.	
31	20	0	69	62	855	660	West.	North.	Cloudy.	
32	22	2	70	60	793	488	West.	North-West.	Cloudy.	
33	13	1	69	62	855	575	West.	North.	Cloudy.	
34	10	1	76	60	971	635	East.	North-East.	Cloudy.	Rain.
35	16	5	73	61	949	598	North.	West.	Cloudy.	Fine.
36	12	5	68	60	770	554	West.	North.	Fine.	Cloudy.
37	11	3	69	63	971	749	South.	West.	Cloudy.	Rain.
38	19	3	70	54	968	700	South.	West.	Cloudy.	
39	19	2	67	52	937	717	West.	North-East.	Fine.	Rain.
40	10	2	65	58	935	749	West.	South-East.	Rain.	Cloudy.
41	13	3	63	55	935	652	West.	North. S-East.	Cloudy.	
42	15	2	63	40	937	618	West.	West.	Rain.	
43	13	3	54	37	924	627	West.	North-West.	Cloudy.	
44	15	1	57	48	879	713	West.	West.	Cloudy.	
45	10	3	56	38	961	705	West.	West.	Cloudy.	
46	14	3	44	31	1000	557	North.	North.	Foggy.	Rain.
47	16	4	53	36	943	781	West.	West.	Cloudy.	Rain.
48	12	4	62	40	968	767	West.	West.	Cloudy.	Rain.
49	14	2	50	36	1000	790	West.	North-East.	Foggy.	Cloudy.
50	11	0	52	38	1000	762	West.	East.	Foggy.	
51	11	4	51	41	967	763	West.	South.	Foggy.	Cloudy.
52	9	1	47	28	971	585	West.	West.	Cloudy.	
Total	588	104								

Metercological Table, with reference to Admissions and Deaths, for 1826.

Weeks.	Admissions.	Deaths.	Heat.		Moisture.		Wind.		Weather.	
			Max.	Min.	Max.	Min.				
1	4	0	40	33	968	794	East.	East.	Cloudy.	Fine.
2	10	3	33	21	910	612	North.	North.	Hazy.	
3	10	1	42	17	963	745	East.	North.	Fine.	Cloudy.
4	9	1	40	31	1000	783	West.	East.	Cloudy.	Foggy.
5	9	4	50	39	966	709	South.	East.	Foggy.	Cloudy.
6	15	1	52	33	1000	702	South.	West.	Rain.	Fine.
7	10	5	52	39	968	110	South.	South-East.	Fine.	Cloudy.
8	8	1	52	35	1000	680	West.	West.	Fine.	
9	7	3	53	40	940	624	West.	West.	Cloudy.	
10	7	1	62	39	970	698	West.	East.	Fine.	
11	13	2	52	37	963	500	East.	North.	Fine.	Hazy.
12	12	3	57	44	87	74	West.	North.	Fine.	
13	12	2	62	56	60	76	West.	West.	Cloudy.	
14	13	1	62	58	63	81	East	East.	Fine.	
15	9	0	54	49	72	80	West.	West.	Cloudy.	Fine.
16	15	3	56	50	61	74	East.	North-East.	Fine.	Cloudy.
17	5	5	58	52	59	68	East.	East.	Fine.	
18	14	0	66	56	63	69	East.	West.	Fine.	
19	10	5	66	59	60	76	East.	East.	Rainy.	
20	9	1	65	59	63	68	East.	West.	Cloudy.	
21	12	1	73	66	60	68	N-East.	N-East.	Fine.	
22	18	2	74	68	63	90	West.	East.	Fine.	
23	20	1	74	65	80	95	East.	North.	Fine.	
24	15	1	78	74	65	86	East.	South.	Cloudy.	Fine.
25	14	2	78	74	66	76	West.	West.	Cloudy.	
26	14	0	74	74	53	79	West.	West.	Fine.	
27	17	2	74	62	66	76	West.	West.	Fine.	
28	14	1	78	67	61	72	North.	East.	Fine.	
29	18	4	78	68	59	75	East.	North.	Fine.	Cloudy.
30	10	3	73	49	61	92	North.	North-East.	Rain.	Fine.
31	19	2	84	55	60	84	East.	North-East.	Variable.	
32	16	1	78	55	65	84	North-East.	West.	Variable.	
33	20	1	73	65	59	79	West.	South-West.	Variable.	
34	15	4	85	60	50	72	West.	South-West.	Cloudy.	Fair.
35	15	2	79	57	65	75	West.	South-West.	Cloudy.	Fair.
36	14	3	73	40	69	91	West.	South-West.	Cloudy.	Fair.
37	19	2	69	47	71	88	West.	West.	Fine.	
38	19	2	71	51	73	93	East.	North-East.	Fine.	
39	15	1	69	44	74	91	East.	South-West.	Cloudy.	Rain.
40	12	3	70	41	75	88	S-West.	S-West.	Foggy.	
41	14	1	67	42	75	89	S-West.	S-West.	Foggy.	Rain.
42	14	2	66	45	76	96	South.	South-West.	Foggy.	Cloudy.
43	12	5	69	40	80	96	West.	North-West.	Foggy.	Rain.
44	17	1	56	40	78	98	West.	West.	Foggy.	Rain.
45	10	2	50	31	78	98	West.	North-West.	Foggy.	
46	10	4	53	33	82	97	West.	North-West.	Cloudy.	
47	13	1	47	38	75	93	East.	North-East.	Rain.	
48	8	1	50	30	74	93	West.	South West.	Fine.	Foggy.
49	18	3	54	33	82	98	West.	North-West.	Cloudy.	Rain.
50	16	4	54	45	87	99	S-West.	S-West.	Fair.	Foggy.
51	14	3	49	33	85	98	East.	North-East.	Foggy.	Fair.
52	11	3	52	34	85	98	N-East.	N-East.	Foggy.	
Total	676	110								

Metereological Table, with reference to Admissions and Deaths, for 1827.

Weeks.	Admissions.	Deaths.	Heat.		Moisture.		Wind.		Weather.	
			Max.	Min.	Max.	Min.				
1	10	1	49	18	98	74	West.	North.	Fair.	
2	7	2	53	31	98	85	West.	South-West.	Rain.	Fair.
3	14	0	53	25	96	76	West.	North-East.	Cloudy.	Fair.
4	8	1	42	18	95	81	West.	North-East.	Cloudy.	Foggy.
5	12	3	46	27	98	75	East.	North-East.	Fair.	
6	6	1	41	28	93	75	East.	North-East.	Fair.	
7	9	3	40	19	87	80	East.	North-East.	Fine.	
8	13	1	40	29	89	72	East.	North-East.	Fair.	Cloudy.
9	10	0	50	30	98	82	West.	South-West.	Cloudy.	
10	10	1	56	32	93	78	West.	South-West.	Fair.	Rain.
11	12	0	56	32	88	77	West.	North-West.	Fair.	
12	4	0	48	35	97	75	West.	West.	Fair.	
13	10	1	58	35	89	76	West.	West.	Cloudy.	Fair.
14	2	0	67	46	98	75	West.	North-East.	Fine.	
15	8	0	58	41	92	72	West.	West.	Fine.	
16	19	4	52	39	92	78	East.	North-East.	Cloudy.	Rain.
17	6	2	71	34	88	68	Variable.	Variable.	Fair.	
18	11	1	72	44	95	79	West.	South-West.	Cloudy.	
19	14	1	59	34	94	72	East.	North-East.	Fair.	
20	16	0	70	46	88	75	East.	South-West.	Fair.	
21	12	2	72	45	90	73	West.	West.	Cloudy.	
22	21	0	70	45	92	78	West.	West.	Cloudy.	
23	9	0	70	48	92	74	West.	West.	Fair.	
24	23	2	75	52	92	71	East.	West.	Fair.	
25	13	1	74	50	87	73	West.	West.	Fair.	
26	23	5	72	58	98	77	West.	West.	Rain.	Fair.
27	13	1	79	55	92	74	Variable.	Variable.	Fair.	
28	15	0	80	53	82	70	East.	North-East.	Fair.	
29	15	2	76	56	82	68	East.	East.	Cloudy.	
30	17	1	84	57	92	78	West.	West.	Cloudy.	Fair.
31	17	3	80	53	84	72	West.	West.	Cloudy.	Fair.
32	17	2	72	50	86	74	West.	West.	Cloudy.	
33	16	2	72	54	93	74	East.	North-East.	Fair.	
34	18	5	78	52	90	75	East.	North-East.	Fair.	
35	20	2	78	53	93	78	East.	North-East.	Cloudy.	Fair.
36	14	6	68	51	96	80	East.	North-East.	Fair.	Cloudy.
37	17	6	71	51	91	78	East.	North-East.	Fair.	Cloudy.
38	16	1	64	49	91	81	West.	South-West.	Fair.	Cloudy.
39	14	0	64	52	100	87	West.	South-East.	Cloudy.	
40	16	2	61	47	100	95	West.	West.	Cloudy.	
41	13	2	64	43	98	86	West.	West.	Fair.	Cloudy.
42	15	2	63	57	98	85	West.	South-East.	Foggy.	
43	16	2	60	37	100	89	S-East.	S-West.	Fair.	Cloudy.
44	23	2	57	39	99	78	West.	North-West.	Foggy.	
45	13	3	60	39	98	92	West.	North-West.	Fair.	Cloudy.
46	5	0	52	40	100	86	East.	South-East.	Foggy.	
47	12	1	45	25	100	83	N-West.	N-West.	Fair.	
48	15	3	53	41	100	96	West.	West.	Cloudy.	Rain.
49	9	0	56	36	97	80	West.	West.	Fair.	
50	9	2	55	38	98	86	West.	West.	Rain.	Fair.
51	9	3	55	39	98	97	West.	West.	Rain.	
52	17	1	52	31	98	87	West.	South-West.	Foggy.	
Total	676	87								

Metereological Table, with reference to Admissions and Deaths, for 1828.

Weeks.	Admissions.	Deaths.	Heat.		Moisture.		Wind.		Weather.	
			Max.	Min.	Max.	Min.				
1	8	3	50	33	98	96	East.	West.	Cloudy.	
2	9	0	47	28	99	85	East.	South-East.	Cloudy.	Snow.
3	11	1	56	38	99	86	East.	North-East.	Rain.	Cloudy.
4	14	3	53	40	98	90	West.	West.	Cloudy.	
5	11	1	54	39	96	90	West.	West.	Rain.	Fair.
6	8	2	54	28	98	90	West.	East.	Cloudy.	Snow.
7	11	0	41	28	98	90	West.	West.	Fine.	
8	13	2	52	36	98	90	East.	West.	Cloudy.	Rain.
9	7	1	57	38	98	94	West.	West.	Fair.	
10	11	1	55	31	98	76	East.	North-West.	Fair.	
11	18	2	62	44	94	86	West.	West.	Fine.	
12	5	0	64	36	98	92	West.	West.	Fair.	Hail.
13	13	2	52	33	98	92	East.	North-East.	Foggy.	Rain.
14	8	3	53	35	98	82	East.	North.	Cloudy.	
15	15	1	61	38	98	95	East.	South-West.	Rain.	Fine.
16	14	4	61	43	98	94	West.	West.	Rain.	
17	14	2	65	39	97	80	West.	West.	Fair.	
18	16	3	68	45	98	75	West.	East.	Fair.	
19	10	0	66	43	98	80	East.	West.	Fair.	
20	16	2	68	47	92	85	East.	South-East.	Fair.	
21	8	2	68	47	98	90	East.	South-East.	Rain.	Fair.
22	8	1	71	52	98	78	West.	West.	Fair.	
23	3	0	70	51	94	77	West.	West.	Fair.	Rain.
24	13	1	73	54	78	75	N-West.	N-West.	Fair.	
25	13	1	73	56	96	75	S-East.	S-East.	Rain.	Fair.
26	12	1	80	55	96	79	N-West.	N-West.	Fine.	
27	8	1	79	56	100	91	West.	West.	Cloudy.	
28	18	0	77	65	74	43	S-West.	S-West.	Cloudy.	Rain.
29	11	1	73	55	66	48	N-West.	N-West.	Cloudy.	
30	24	2	73	51	50	49	N-West.	N-West.	Fine.	
31	13	0	72	66	51	49	East.	East.	Rain.	Fine.
32	14	2	74	53	50	49	S-East.	S-East.	Fine.	
33	18	3	74	44	52	40	West.	South-West.	Cloudy.	Rain.
34	12	2	68	42	50	47	S-East.	S-East.	Fine.	
35	22	1	73	56	54	50	S-West.	S-West.	Foggy.	Fine.
36	11	4	66	45	55	51	West by North.	West.	Foggy.	Rain.
37	16	1	63	48	56	51	West.	West.	Foggy.	Fine.
38	10	3	63	39	55	50	N-West.	N-West.	Foggy.	Fine.
39	17	4	63	38	68	52	East.	South-West.	Foggy.	Fine.
40	14	4	53	39	68	55	East.	South-East.	Fine.	
41	8	0	53	26	67	55	S-East.	S-East.	Fine.	Foggy.
42	13	2	56	26	75	55	S-East.	S-East.	Fine.	
43	8	1	63	42	64	55	East.	North-West.	Fine.	Foggy.
44	5	5	54	39	68	58	East.	North. N-East	Fine.	Cloudy.
45	4	0	44	35	67	53	S-East.	South. S-East.	Fine.	Foggy.
46	12	3	54	28	74	63	East.	South-East.	Rain.	Cloudy.
47	7	1	56	41	68	56	S-West.	S-West.	Fine.	
48	13	0	59	35	68	56	West.	North-West.	Fine.	Cloudy.
49	13	1	53	38	65	64	West.	S. South-West.	Foggy.	Rain.
50	10	1	56	40	68	65	West.	West.	Fine.	Cloudy.
51	9	0	57	41	65	65	N-West.	W. N-West.	Fine.	
52	9	0	45	36	69	65	S-West.	S-East.	Foggy.	Rain.
Total	597	81								

Occupation of Patients, with reference to Susceptibility, for one year.

Servants	150	Brought up	417
Labourers	126	Fishmongers	2
Shoemakers	18	Gardeners	2
Tailors	17	Corkcutters	2
Fruiterers	13	Farmers	2
Carpenters	10	Braidmakers	2
Weavers	10	Watchmakers	2
Bricklayers	8	Cagemakers	1
Bakers	6	Guncapmakers	1
Dress Makers	6	Blacksmiths	1
Painters	5	Combmakers	1
Plasterers	5	Coppersmiths	1
Sailors	5	Firemen	1
Printers	3	Distillers	1
Sawyers	3	Masons	1
Butchers	3	Cabinetmakers	1
Porters	3	Milkmen	1
Sweeps	3	Saddlers	1
Chair Women	3	Ferulemakers	1
Pot-boys	3	Coachbuilders	1
Shop-boys	3	Mercers	1
Silversmiths	2	Bargebuilders	1
Grocers	2	Cheesemongers	1
Furriers	2	Sawmakers	1
Curriers	2	Clockmakers	1
Woodmen	2	Upholstresses	1
Grooms	2	Poulterers	1
Skinners	2	Destitute	230
Carried up	417	Total	679

Sex of Patient, with reference to Susceptibility.

1825.	1826.	1827.	1828.
Males, 289	Males, 325	Males, 337	Males, 278
Females, 299	Females, 351	Females, 339	Females, 319
Total, 588	Total, 676	Total, 676	Total, 597

Sex of Patient, with reference to Mortality.

1825.	1826.	1827.	1828.
Males, 53	Males, 56	Males, 48	Males, 33
Females, 51	Females, 54	Females, 38	Females, 48
Total, 104	Total, 110	Total, 86	Total, 81

Locality of Patient, with reference to Susceptibility.

	Country Unhealthy.	Town Unhealthy.	Town Healthy.
Servants	12	31	96
Labourers	0	88	48
Destitute	0	43	50

Table of Ages, with reference to Susceptibility.

Age, for 1825.		Age, for 1826.		Age, for 1827.		Age, for 1828.	
Under 10	42	Under 10	27	Under 10	25	Under 10	31
15	67	15	87	15	70	15	80
20	172	20	170	20	163	20	136
25	133	25	143	25	164	25	107
30	81	30	102	30	107	30	84
35	29	35	46	35	35	35	47
40	28	40	37	40	50	40	45
45	10	45	28	45	20	45	21
50	10	50	13	50	13	50	17
55	10	55	7	55	8	55	6
60	1	60	5	60	13	60	14
65	1	65	3	65	2	65	6
70	2	70	3	70	4	70	1
75	1	75	4	75	2	75	2
80	1	80	1	80	0	80	0
85	0	85	0	85	0	85	0
Total,	588	Total,	676	Total,	676	Total,	597

Table of Ages, with reference to Mortality.

Age, for 1825.		Age, for 1826.		Age, for 1827.		Age, for 1828.	
Under 10	3	Under 10	1	Under 10	5	Under 10	4
15	5	15	10	15	5	15	5
20	29	20	35	20	16	20	12
25	25	25	14	25	17	25	11
30	17	30	20	30	18	30	12
35	2	35	3	35	1	35	4
40	7	40	7	40	10	40	7
45	6	45	4	45	5	45	5
50	4	50	5	50	4	50	7
55	3	55	1	55	2	55	1
60	0	60	3	60	1	60	4
65	0	65	2	65	0	65	3
70	2	70	1	70	0	70	0
75	1	75	2	75	2	75	1
80	0	80	2	80	0	80	0
85	0	85	0	85	0	85	0
Total,	104	Total,	110	Total,	86	Total,	76

Relation between Date of Attack, Admission and Cure, in 600 Cases.

Admitted on.		Dismissed on.		Duration of Disease.	
1st Day of Fever	2	11th Day	11	11 Days	11
		12	2	12	2
2	6	13	6	13	6
		14	8	14	8
3	29	15	4	15	4
		16	9	16	9
4	47	17	7	17	7
		18	15	18	15
5	54	19	14	19	14
		20	15	20	15
6	43	21	18	21	18
		22	11	22	11
7	138	23	19	23	19
		24	27	24	27
8	35	25	15	25	15
		26	17	26	17
9	25	27	24	27	24
		28	22	28	22
10	20	29	25	29	25
		30	13	30	13
11	4	31	13	31	13
		32	15	32	15
12	7	33	12	33	19
		34	12	34	12
13	4	35	16	35	16
		36	13	36	13
14	71	37	24	37	24
		38	14	38	14
15	11	39	12	39	12
		40	10	40	10
17	3	41	8	41	8
		42	7	42	7
18	2	43	7	43	7
		44	15	44	15
19	1	45	7	45	7
		46	6	46	6
21	43	47	7	47	7
		48	3	48	3
28	8	49	8	49	8
		50	6	50	6
30	2	51	7	51	7
		52	4	52	4
42	2	53	2	53	2
		54	5	54	5
56	1	55	1	55	1
		56	1	56	1
60	1	57	4	57	4
		58	3	58	3
Unknown	21	59	2	59	2
		60	5	60	5
		62	1	62	1
		Beyond 62	24	Beyond 62	24
		Unknown	16	Unknown	16

Relation between date of Attack, Admission, and Death, for one year, comprehending 84 Cases.

Admitted on		Admitted on	
3d day of fever	5	13th day of fever	1
4	4	14	13
5	2	17	1
6	4	21	16
7	11	28	5
8	6	30	1
9	3	42	3
10	3	Unknown	4
11	2		

Died on		Died on	
7th day of fever	1	25th day of fever	2
8	2	26	1
9	2	27	3
10	4	28	3
11	7	29	1
12	2	30	3
13	1	31	4
14	6	32	1
15	2	33	1
16	2	35	4
17	2	36	2
18	1	37	2
19	1	40	1
20	5	41	1
21	3	42	1
22	1	60	2
23	2	Unknown	4
24	4		

Died on		Died on	
1st day after admission	4	13th day after admission	1
2	5	14	7
3	11	15	1
4	8	16	3
5	5	18	1
6	8	19	2
7	5	20	1
8	2	28	1
9	1	30	1
10	5	34	2
11	4	44	1
12	4		

Proportions of Type out of 300 Cases.

Synochus - - - - - -	235
Typhus Mitior - - - - -	21
Gravior - - - - -	1
Scarlatina - - - - - -	40
Intermittent - - - - -	1
Remittent - - - - - -	2

Proportions of Internal Characteristic Affection out of 300 Cases.

Cerebral - - - - - -	66
Thoracic - - - - - -	79
Abdominal - - - - - -	60
Mixed - - - - - -	95

Proportions of External Accidental Affection out of 300 Cases.

Erysipelatous - - - - -	11
Glandular - - - - - -	6
Cynancheal - - - - - -	5
Herpetic - - - - - -	3
Laryngeal - - - - - -	1
Phlegmatial - - - - - -	1
Rheumatic - - - - - -	1

Miscarriage - - - - -	7
Preternatural Cutaneous Sensibility -	4

Abstonsia